The Builder.

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A Walk and Talk in the Baths of Rome.

NO monuments of Imperial Rome have been, till modern times, more maltreated, and, throughout the Mediæval period, none, it seems, were more absolutely forgotten, than the Thermæ, which neither popes nor baronial families cared for in any way. Yet their original uses and splendours were long maintained after the prevalence of Christianity, and the strange superstition which makes a virtue of uncleanliness did not withhold the followers of the true religion from frequenting them, like their pagan forefathers. Ammianus Marcellinus, in the fifth century, rhetorically compared their vast structures to *provinces*, rather resembling such, he affects to consider, than any single edifice raised for particular purpose. In the year 466, when Sidonius Apollinaris wrote of them in indifferent verse, it is certain those of Diocletian, and of Nero and Alexander, were still serviceable, nor touched by decay.

The sack of the city by Alaric probably inflicted injuries on these Thermæ; but it is supposed that their maintenance for public use did not cease till after the siege by Vitiges, A.D. 537, during which the aqueducts were so far destroyed as to cut off entirely the supply of water from them; and from this date we find no farther mention of the Thermæ for a long period, unless we might understand as such an allusion to the practice of bathing among the Romans by St. Gregory. Of the nine Roman baths here whose ruins exist in more or less fragmentary state, only three still present vast and imposing masses that enable us to form any idea of scale or plan. Those of Agrippa are reduced to a single hemicycle with a few adjoining brickwork walls, half concealed by the houses of an obscure street behind the Pantheon; though, indeed, that celebrated temple may itself be considered a transformed and consecrated member of the same body. Those of Commodus, Septimius Severus, Decius, and Philip, may be referred to their sites, but not recognized in any visible remains: those of Alexander (the amplification or renovation of Nero's) existed till towards the middle of the last century in considerable remains within the courts of the Palazzo Madama (now post-office), but were swept away to give place to the public offices raised under Benedict XIV.; and the sole remnants of that splendid edifice now extant are some granite columns in the cellars of the Giustiniani palace, and a brick hemicycle, till recently visible (as described in Murray's "Handbook" and Platner's *Beschreibung*) behind a house on the Piazza Rondanini; but now completely shut from view by recent buildings! The latest erected Thermæ, those of Constantine, on the Quirinal (326), were preserved—still conspicuous in the seventeenth century—till the Rospigliosi Palace, founded by Cardinal Borghese (nephew of Paul V.), rose above and crushed them, so to say, out of sight, the remnant being now buried in the cellars of that princely mansion.

Till the ninth century the ruins on the Esquiline, immediately overlooking the Colosseum, were called *Thermæ Traianæ*, as Nibby argues they should be, instead of "Baths of Titus," their now common designation; and as Titus, Domitian, Trajan, all, built or enlarged such establishments on this Hill, it is possible that the line of observation between their several works may be confused,—to us moderns, perhaps, undefinable. Not till near the end of the fifteenth century were these ruins partially re-opened and cleared, after being long almost buried under soil; and the antiquarian writer, Albertini, first referred them to Titus, instead of the later emperor. Vasari, in his Life of Giovanni da Udine, tells us that artist, in company with Raffaelle, explored their subterranean chambers and copied the arabesques on their walls, in order to avail himself of what suggestions might prove suitable for his decorative stuccoes in the loggie of the Vatican. What Raffaelle and his pupil then saw was soon again consigned to oblivion by the sinking of the soil from the garden above; and the same interiors were not penetrated again till 1774, after which one Mirri published coloured engravings of all their fresco-paintings. The now accessible chambers are but a portion of the extent then a second time laid open; and the stucco reliefs, as well as those frescoes, are supposed to have much suffered since Mirri and Giovanni da Udine saw them.

Flaminius Vacca mentions excavations effected, and valuable artistic relics discovered here in his time; and in 1594 a fine marble cornice was moved from these ruins to adorn the new church of the Jesuits. At last, in 1811, orders were given by French authority to disencumber them to the utmost extent, and render the whole series of chambers accessible. After three years' labour was opened a suite of parallel halls, with front extending 300 feet; but of eleven parallel chambers belonging to Titus's Baths, nine only are now accessible, communicating with an inner suite, more spacious, towards which they (the outer) run obliquely; this non-correspondence of plan between these two ranges showing clearly the difference of origin, the outer being the addition of Titus, the inner and larger halls those of the Neronian Palace, that "Golden House" whose gardens and pleasure-buildings covered the entire surface of the Esquiline Hill. In two halls, more spacious than the others, are rectangular alcoves for couches, enabling us here to recognize the *triclinium* for the banquet; and in the centre of one is a deep cavity for a fountain, enclosed by a parapet, along which runs a species of grove for flowers or shrubs, that may have been planted in soil here embedded. The hall containing this fountain had evidently been an open court in the Neronian Palace, and unroofed till the earlier edifice was sacrificed to the later. In 1813 was first re-opened by the French a lofty narrow gallery (*crypto porticus*) that passes along the inner extremity of the chambers, at a right angle with their partition-walls, lighted originally by fifteen skylights in the vaulted roof, and supposed to have flanked one side of an inner hypethral court, in the midst of the Neronian buildings. It seems never to have been finished, no traces of incrustation being found on its walls, nor pavement on its floor; but its vault is decorated with paintings of exquisite beauty, now seen by the glare of the *custode's* torch fixed to the end of a long wand; for this corridor is in total darkness, its windows all closed since the time the palace was converted into Thermæ. By the torchlight, however, we can well distinguish the gracefully fantastic figures of Bacchante, citharisti, fauns, bright-plumaged birds, and griffins, divided by Arabesque borders of beautiful design and still vivid colouring. Similar frescoes are seen on walls and vaults elsewhere, though in no such perfect series. Within an arched niche, in one of the larger halls, there is a tiny group, called "Venus with her Doves," representing a female reclining, draped from the waist, otherwise nude; another entering towards her by a lateral door, and two birds hovering above,—graceful, and still distinctly seen when the *custode* lifts his torch in the darkness prevailing throughout these inner chambers, as in the corridor beyond. Another fresco in the same chamber is said to represent the celebrated meeting between Coriolanus and his mother. Here, within the niche of the Venus, we are erroneously told was found the Laocoon, on a pedestal the nucleus of which still stands—a manifest error, for the story of that discovery indicates *another* site on the Esquiline, near the ruins called *Sette Sale;* and the fragment of the pedestal here does not correspond with the dimensions requisite for supporting such a group. The style of the paintings in these halls reminds us of Pompeii, especially in the fantastic unsubstantial architecture amid which some of the figures are standing or floating; and till the discovery of those other vault-paintings in the tombs on the Latin Way (opened a few years ago), the decorations of the Golden House, thus buried and built up in Titus's Baths, had been considered the finest specimens of fresco art preserved from Roman antiquity. Before quitting these ruins we may observe the marks of more modern division-walls and staircases, showing the use to which they were applied for family residence, first, it is supposed, in the interval between the death of Nero and the innovations of Titus; afterwards in the twelfth century; between which periods—it is supposed in the sixth century—was formed here a chapel dedicated to St. Felicitas and her seven sons, all martyrs, which, when re-opened by the French explorers, contained early Christian paintings—"The Good Shepherd," "Daniel and the Lions," &c., now totally vanished, excepting, indeed, a faint trace of that in a niche, representing the sainted mother with her children. These Thermæ being in an inclosed demesne, were happily saved from the profanations to which other Roman monuments were exposed; and the *custode*, resident in a cottage on the spot, is competent, nay, ingenious, as attested by sundry ornamental objects wrought by him in the coloured marbles and alabasters here found in profuse fragments, which the good man exhibits and offers for sale.

At a level much higher on the same hill, in the extensive and pleasant gardens of the monastery of S. Pietro in Vincoli, rise picturesquely amidst trees and luxuriant wild growth that veils or crowns the ruin-walls, those so-called *Sette Sale*, supposed to be the reservoirs for the Thermæ of Trajan, consisting of nine parallel vaulted chambers, of which two being inaccessible the popular parlance ignores their existence, indicating as the "Seven Halls" what should be reckoned "nine." They communicate with each other by, in each partition-wall, four arched apertures, placed to alternate in such a manner, for resisting the action of the water, that no two are opposite; and we look through the whole series of doorways obliquely, obtaining a view of the entire suite, striking and singular in effect. Their vaulting is scarcely injured, their inner walls for the most part perfect; and when, some two years ago, the roof of one chamber fell in, repair was effected by order of the authorities. At intervals among the vines and forest-trees of these gardens rise three great circular ruins, one partly built into the Polveriera (powder magazine) that stands at the lower limit of the inclosed grounds; the other two rising, in their isolation, with a picturesque grandeur enhanced by the quiet beauty of that garden scene around; and on their inner walls we see two files of niches for statues. Outside one of these rotundas is a lofty concentric corridor, much ruined, the whole resembling a structure in which rotunda and corridor are united on this plan, among the Palatine buildings. Writers of the sixteenth century used to call this entire group of scattered ruins, "Baths of Titus;" and point out one portion as the palace of either that emperor or Vespasian: they have been since recognised as the Thermæ of Trajan, to which also belonged the more subterranean hall supported by massive piers, connected with a place of worship by Pope Sylvester, in Constantine's

time, and still used as a crypt chapel under the church of S. Martino ai Monti. In a garden-house near these remains lie some immense granite columns, dug up among the ruin heaps, and now exposed for sale: one, a shaft of fine red granite, 6½ palms in diameter, was purchased to be laid down, cut into ample disks, on the pavement of the new St. Paul's. Near this spot we may ascend a mound of fallen brickwork, whose platform-summit is paved with mosaic in black and white cubes; whence (as indeed from other parts of this garden) we enjoy a view of Rome's ruins and environs, comprising Mediæval towers and churches on the Cœlian and Esquiline, a distance of the Campagna and the Alban Hills, among the most grandly beautiful of the many unforgetable scenes that invite contemplation within this city's walls.

But ruin and nature are nowhere more picturesquely combined than in the most vast and magnificent remains left by any imperial Thermæ, the baths of Caracalla, where the arbutus and lofty forest-trees grow along the summits, or under the shadow of stupendous walls, as well as the monthly rose and ivy,—in some instances the enormous masses of fallen masonry being converted into beds of verdure; and the portions of roofing still preserved, all covered with shrubs and wild flowers. That these buildings were restored by Theodoric, A.D. 500, is inferred from the *sigla* on tiles, with that date and name, found in excavations. The Anonymous of Einsiedlin (*v.* Mabillon), and the *Mirabilia*, report as to their conditions in the Middle Ages, during which, however otherwise injured, they did not share the fate of other monuments in being fortified to become the stronghold of any baronial family: more were crushed or hidden to support towers and bastions, but left open to the public, apparently disregarded by all those powerful to appropriate or destroy. As described by Poggio, in 1450 they had still much of their antique magnificence: marble incrustations still shone on their walls: columns and architraves stood erect in their places. All this was swept away to gratify the family pride of a pope, when about 1534, Paul III. ordered a systematic spoliation of these ruins to procure adornment for the Farnese Palace; and not only marble, sculptures, architectural fragments, but even the coatings of lateritial brickwork were torn from these walls to supply the new residence for that unscrupulous family. This proceeding, however disgraceful, led to discoveries most valuable for the study and appreciation of antique art—the Hercules and Flora, both known as "Farnese," and the Dirce tied to the horns of the bull (the so-called *Toro Farnese*), also the Venus Callipyge, all now in the museum at Naples. In 1564 the last erect column in these ruins was transferred to Florence, a present to Cosmo I., who raised it, with the bronze statue of Justice on its summit, as a monument of his victories in civil war. Thus despoiled, the whole edifice was at last cleared, and rendered accessible on every side, by order of Paul V.; not, indeed, for *public* benefit, but for the students of the Roman seminary, on which institution the ground was bestowed, that those *alumni* might convert the area into a ball-court, and otherwise amuse themselves here undisturbed. About the middle of the last century, two chambers (or tribunes), terminating in apses, were wantonly destroyed in a vineyard belonging to the Jesuits' College, within which one part of the site had been enclosed. For many years no excavations have been carried on; and the last of important result in these ruins were those undertaken by Count de Velo, 1824, that brought to light the largest and most complete mosaic yet found among the relics of ancient Roman art; the set of life-size figures and busts, supposed portraits of favourite athletes, with their implements and trophies, discovered in a nearly perfect state, within a great hemicycle of the Thermæ, and now laid in the pavement of a hall at the Lateran Palace, where, being most skilfully restored, it may be best observed from a balcony carried along one end of the spacious room. Invaluable as illustrative of the gymnastic and pugilistic spectacles of imperial Rome, this group, in its specimens of *humanity*, is simply revolting; and those giants of flesh and muscle, with their apish faces, intensely animal character, heads tapering into nullity, seem the connecting link between the man and the brute. The spirited design may be admired, and from a distance the execution, coarse as it appears when examined closer, has good effect. The Caracalla Thermæ have been well cared for in the arrangements of Rome's modern government, and are under the protection of a *custode*, entered only by one wicket-door at the northern end, where we have to ring for admission; but the *mal' aria*, here fatally dominant, prevents their guardian from remaining at night, so that we cannot enjoy the pleasures of a moonlight stroll (save by special appointment) to admire the mysterious solemnity of the same at such hours, as we may in the Colosseum; nor has the favourite spectacle of Bengal illumination been introduced amid these ruins. A modern staircase descends to the platforms of the roof, at two levels, still preserved, allowing us to contemplate the whole, and appreciate the plans of the majestic edifice more satisfactorily; and here too was beheld one of the noblest views across the most monumental region of Rome, and over the Aurelian fortifications to the Campagna and southern mountains. Within one angle of the ancient walls, divided off by a partition, has been formed a magazine of the sculptured and architectonic fragments dug up during the last researches made here; and among those objects are some busts, especially a Bacchante (or Ariadne), of high ideal character, but so mutilated that it has not been proposed to transfer them to any museum. Much of the ancient pavements in mosaic of porphyry, serpentine and giallo antico, in a simple design like scales, is now visible, at a level below the grassy soil on which we tread till reaching those portions opened by the excavations of 1824, and in one hall this broken-up surface of long-buried pavement displays figures of marine monsters in black and white marbles. The ruins left by the great quadrangular inclosure, with porticos and chambers (supposed to have served for lodging soldiers and slaves attached to the baths), added by Heliogabalus and Alexander to that central structure of Caracalla's building, are now in great part concealed by trees and brambles, so little conspicuous that, perhaps, many tourists have failed to discover them, but still most picturesque under their leafy mantle of Nature's weaving. Their principal extent corresponds to the Appian Way, skirting one side of the vineyards that occupy the levels between that road and the inclosure containing the great body of ruins. Many of their low vaults are entire, others completely fallen in and now reduced to heaps of brickwork overgrown by plants and weeds, luxuriant ivy spreading itself over both erect and prostrate masses. The best preserved chambers are in the vineyard of Signor Guidi (a gentleman well known for his activity in antiquarian researches), who has formed in these dark recesses and on their esplanades in front a museum of miscellaneous antiques, epigraphs, vases, sculptured details, &c., not without value; and a few of these less ruined interiors serve for wine-vaults, outside of which may be seen on fine evenings some jovial party drinking at a table, whilst a good woman sits at her knitting ready to serve them. This aspect of the great ruin, the least known or visited by strangers, and beyond the domains of the custode, is indeed the most affecting in the beauty of decay, as well as picturesque in its wildness.

These Thermæ of Diocletian, the vastest in extent,—having accommodation for 32,000,—exactly double the number who could be received in Caracalla's edifice,—have been merged into churches and monasteries to such a degree that the Christian almost obliterates the Pagan character of the whole; and the occupation by French soldiers now contributes to bewilder our studies on the site. Beronius states that the labour of 40,000 Christians, condemned to work as slaves, raised these enormous buildings, which probably received the first shock to their ancient integrity at the Gothic siege and sack in 410; but certainly were again restored to use before the close of that century. Fulvio (writing in 1527) describes the lofty, spacious halls and rotundas, immense columns, and cisterns still left here, unconcealed by modern buildings. Palladio designed a plan and elevation from what he beheld of ruin extant in his time; and Albertine describes what he witnessed—the disinterment of several busts of emperors, transferred hence to the Capitoline Museum, but some sent to Florence. The first inclosure of the entire Thermæ within private property was in the sixteenth century, when the ground was purchased, and a sumptuous villa erected by Cardinal Bellay, ambassador of Francis I. at Rome; and after his death, 1560, the Horti Bellaiani, as the estate was called, passed into the hands of a more illustrious cardinal, St. Carlo Borromeo. From the latter it was bought by his uncle, the reigning Pope, Pius IV., who desired to settle the Carthusian monks on this spot, bestowed the ground with its ruins upon them, and engaged Michelangelo to build that noble church, which, injured as it is, by the graceless alterations of Vanvitelli, is still one of the finest in Rome, and chief attraction of this remote spot; the Tepidarium, Calidarium, and part of the Frigidarium being preserved in Buonarotti's work, and eight granite columns still erect in their places in the vast nave (406 by 124 palms), which also preserve the Pinacotheca of the Thermæ.

In 1593 the Carthusians sold the ground beyond their cloisters, with several groups of ruins, and large stores of sculptured fragments, columns, &c., to the Countess de' Nobile Sforza, who bestowed her entire purchase on the Reformed Cistercians, and through whose bounty were soon raised another church and monastery for the latter order, a great circular hall, with cupola and coffered vaulting, still entire, answering the purpose, and now forming the parish church, S. Bernardo, which, though modernized, retains the majestic simplicity of its original design. From its cloisters extends, through the monastic demesne beyond, an immense curvilinear exedra, pierced by twenty-seven niches, no doubt once adorned by statuary; and this had communicated with another rotunda, corresponding to the present S. Bernardo, now built up into one end of a felons' prison. Urban VIII. reduced one great wing of the ruins to a public granary: another, stretching laterally to the Carthusian church, has been absorbed into the unsightly buildings of a house of industry. The piscina, measuring 300 feet by 100 feet, and divided by pilasters, is removed from view within the beautiful gardens of the Villa Negroni (once Peretti) where Alfieri resided, a stately mansion overlooking the quiet planted esplanade that extends between the two monasteries and their several piles of scattered ruins. The eastern side to the principal body of Thermæ has been degraded into a row of paltry houses and stables; the western has almost disappeared, one great circular hall serves for hay-lofts: a spacious quadrangle, entered by lofty archways at each side (but the apertures filled by modern walls), is the lounge of the French troops. We enter the region of ruins which has become a barrack since those troops have garrisoned Rome, by a separate gateway, and find ourselves in a strange scene, confounding farm and barrack, kitchen-garden and stables, mouldering antiquities with vulgar domestic appliances, in indescribable disorder: stupendous vaults and high-hung archways, in the fine brickwork of ancient Rome, here contrast with the paltriest modern masonry; and faded remains of sacred pictures on walls with the obviously profane purposes now in mastery. But in the solemn cloister, surrounded by its arcade of a hundred columns, one of Michelangelo's noblest buildings, simple, grand, and religious, our impressions are indeed different; and from a smaller cloister, planted with fruitful orange-trees, are seen three isolated piles of ruin, that look down on the secluded spot in stern desolation, like phantoms of the past.

Christina of Sweden ordered excavations in these Thermæ (1687), but with no very interesting results; and the last work of Classic art noticeable for high merit that this treasury has yielded, was a head of Venus, in Parian marble, found in the present century, now at the Vatican.

In the deformation of Michelangelo's church by Vanvitelli (1749), the chief entrance was blocked up, and the lateral one, through a rotunda of the ancient building, became the only ingress; the pavement was raised 6 feet, and to the eight columns of red Oriental granite with white marble capitals, Corinthian and Roman in order, were added eight others of brick, with stucco capitals, these latter being covered with a reddish brown varnish. The barbarism was committed of actually disguising in like manner those ancient shafts, and whitewashing *their* capitals! The fine antique vaulting (still entire) was also covered with glaring whitewash; the original architecture, of rich but overcharged style, still remains; and from the nave we may (with permission) enter two great vans, or tribunes, left unaltered by both architects, being reached through invisible doors, two other similar recesses remaining inaccessible.

One should not forget an evidence that oversets the theory accepted in Rome as to the *Sette Sale* and Baths of Trajan. Under these seven chambers is *another* series of reservoirs, of similar construction, now completely filled with earth, but in the last century permeable, and explored by the antiquary Ficoroni, who found in a conduit for conveying water thence, as assumed, not only to the baths, but to the Colosseum and the "Meta Sudans" fountain, the sigla of the builders with an allegoric figure of the subjected Judea, and the legend *Judæa capta*,—a well-known device on the coins of Titus, to which emperor, therefore, must be referred this portion of the Esquiline ruins. As to the Caracalla Thermæ, the excavations begun in 1824 by Count Velo, and continued by the

French Academy, proved the most important for throwing light on the character and arrangements of the whole edifice; and upon their results was founded the first plan drawn up with care of this vast structure by Blouet, the French architect. Soon was published, also, by a Roman *savant*, the outline engraving of that great mosaic called the "School of Athletes," with a critical description.

FOREIGN MATERIALS IN "THE EXHIBITION."*

ITALIAN MARBLES.

THE mineral products of Italy used in architecture and building, are better known to English architects than are the materials of other countries. We have lately quoted from the information supplied in the Catalogue for the Italian division of the Exhibition (published by order of the Royal Italian Commission) much of what relates to marble and burnt clays, and to some of the processes of art-manufacture, as inlaid stone-work, wood-carving, casting in bronze, and work in coral.† Of the Italian marbles, the Exhibition contained specimens in great number and variety.

In that section of the Catalogue which relates to stone and marble, in the introductory matter, (principally furnished by the Professor of Mineralogy and Geology in the Museum of Natural History at Florence), the designation *marble* is "restricted to certain limestones of a crystalline or granular structure, which are sufficiently compact to be susceptible of taking a high polish." The *crystalline*, or *saccharoidal* structure, exemplified in the marbles of the Apuan Alps (Lunigiana, Carrara, Massa, Seravezza, &c.), the "Bardigli" of the same place, the marbles of Valdieri in Piedmont, and certain marbles of Venetia, Trentino, and Brescia, is distinguished from the *granular*, which is seen in the white marbles of Monte Pisano, the yellow marble of Sienna, and the majority of those which were exhibited by the Neapolitan and the northern provinces. If the crystallization be of very decided character, "the structure becomes lamellar, as in the white marble of Pallanza, the Bardigli, and statuary marbles of Monte Rombolo, Monte Calvi (Campiglia), and the Island of Elba, which are in every respect equal to the famous marble of Paros." So far as the best marble for sculpture is concerned, such equality of the Italian marbles with the Greek, we may say, has been questioned. Mr. Burnell, in *The Practical Mechanics' Journal Record of the Exhibition*, observes, "The dead soapy white of the Carrara marble renders it inferior for art-purposes to the richer-toned Parian marbles; but alas! Greece, being 'living Greece no more,' cannot find the energy or the skill requisite to bring its wealth to the market." Since this was written, however, Greece has entered on a fresh existence, and one which seems to be favourable for the investment of English capital in *exploitation* of her products. Mr. About, in his work, "La Grèce Contemporaine," having mentioned the mines and quarries, which, with the exception of the emery mines of Naxos, produced no revenue,—observed:—"If Greece had a government, the mines alone would almost suffice to enrich her." A road from Pentelicus to the Piræus, exists. The Greek Court in the Exhibition afforded little opportunity for judging of the Parian marble in statuary: there were some statuettes and busts, we believe, in Pentelic marble. The actual appearance of the antique sculpture is of course affected by age, and in many cases by its having been buried in earth. The objection to whiteness of the Carrara marble however is entertained by some of the best sculptors. To get rid of this whiteness was, as we understand, Mr. Gibson's object in colouring his Venus: the intention was not to approach fac-simile of the living form.

Marbles fall into the two principal divisions of white and coloured. The white marbles of Italy are divided commercially, into three kinds. The first kind comprises the marbles distinguished as "statuary" (*marmi statuari*); the second, also used for sculpture and for the higher class of architectural ornament, includes a clear white, *marmo bianco chiaro*, and a commoner quality; and the third class comprises the remaining varieties, which are generally inferior to the others in tint or structure, or are veined or spotted, and may be called furniture marbles. The three classes, however, are susceptible of subdivision according to well-known types. The lamellar structure may be a cause of friability under the chisel; though of this structure, is the marble of Paros, and are, as already stated, some of the best of the Italian marbles. These last have a slight blueish tinge and some transparency; whilst, the structure is so homogeneous, that the unequal reflection from different-sized *lamellæ* will not produce disagreeable effect. The quarries of Monte Altissimo were opened by Michelangelo, and afforded the material for several of his works; and they have supplied the marbles for the church of St. Isaac, St. Petersburgh, and the materials for the façade of Santa Croce, Florence. The Falcovaja "statuary" costs on the spot 37s. per cubic foot, to 55s. for large blocks. The marble of Betogli, in the Carrara district, which has a fine appearance, and being easily worked, finds ready sale, has nevertheless slight durability. It belongs to the class known as *saloni*, which should be avoided as much as possible by sculptors. We may here say that those who read Italian, may refer to two separate catalogues of the mineral products, which were published by the Italian Commission, one of them relating to stone and marble, and the other to metallic minerals. The arrangement of the English translation is in some respects defective.* We have no knowledge, however, where even the publications of the British Commission, are now to be procured. The second class of white marbles (*marmi bianchi-chiari e bianchi ordinari*) includes according to the Italian authority, besides varieties which are not suited for monuments in the open air, many others which are admirably adapted; and we believe that the condition of much of the sculpture in the gardens of the Tuileries, and Versailles, has been attributed to bad selection. We fear however that no description of white marble is fitted for out-of-door use in London. Of the third class, veined white (*marmi bianchi-venati*), the best marbles are the *tigrato* of Altagna (Massa) and Monte Corchia, the veined "statuary" (*statuario venato*) of the latter locality, the splashed or spotted (*statuario macchiato*) of Massa, and many of the Carrara marbles.

The white granular marbles (*marmi bianchi ceroidi*) have not nearly the commercial importance of the crystalline. Geologically speaking, "the metamorphic action has not been sufficiently energetic to destroy the last traces of organic matter, and the original stratification of the rock; and the crystallizing force has not been sufficiently exercised to allow of the entire re-arrangement of the whole of the molecules so as to expel the included impurities."

The "coloured marbles" (*marmi colorati*) include black, and all which are of a more or less uniform colour, or are veined, splashed, or spotted, equally, upon a uniformly coloured base. The most important are:—1, black marbles with a uniform or clouded base, or veined with white or yellow; 2, *bardigli*; 3, red marbles of uniform or clouded tint; 4, yellow and violet marbles (*broccatelli*); 5, reddish marbles (*cecciato unito*) or variously veined, from the Albarese; 6, certain varieties of a greenish colour (*verdognolo*); and 7, certain *breccias*, marbles which are formed of fragments of limestones united by a more or less calcareous cement, or fragments of different rocks in a calcareous cement.

The mixed marbles and breccias are very abundant; and it is said, "with an increased demand, they might be supplied in England and France at a lower price than the marbles of the country." It should be observed, however, that some of these marbles are dearer than Italian "statuary." The *Breccia Affricana* of Seravezza is one of them; and the Broccatello of the same locality, costs, for the so-called *mètre*, cubic (of about 28 cubic feet English), 88*l.*, to which item that of conveyance to England would have to be added.

The finest black marbles (*marmi neri*) at present known in Italy, are those of Caserta Vecchia (Terra di Lavoro), the Pisan Mountains, Carrara, and Spezia, and the province of Brescia. In some of these, the black is traversed by white or yellow veins.

The class of the *bardigli* comprises many beautiful varieties. The rarest of these is the turquoise blue (*bardiglio turchino unito*); the finest of them coming from Monte della Capella, near Seravezza. There is a veined bardiglio (*bardiglio venato*) as well as a flowered bardiglio (*bardiglio fiorito*). In the former "an incipient discolouration of the black marble," "changes the primitive colour into a vague tint;" in the latter, "the discolouration is only partially extended through the mass;" and when this is carried to the extreme limit, the result is white marble; and selected specimens show the transition from the original condition. The finest specimens come from the quarries eastward of Seravezza. Other varieties are the veined bardigli of Valdieri, Piedmont; of the Venetian country; of Campiglia, and Monte Rombolo, and of the island of Elba.

The red marbles (*marmi rossi*) come from one or other of the liassic formations. With few exceptions the ammonite, red, limestone is scaly and vitreous, and only found in thin beds. The ordinary specimens are of a light red colour, with ocellated marking (*occhiato*), and of a brecciated structure.

The red ammonite marble is changed into a yellow granular form in the next class, that of the brocatellos and yellow breccias (*marmi gialli*). The mountains of Pisa and Carrara produce marbles of this kind. The Sienna marble is the finest: but it seems that some of the best, and largest in scantling, has yet to be quarried for sale.

The marbles of the three last categories of *marmi colorati* are spoken of, in one part of the Italian catalogue, as of inferior importance; though, immediately afterwards, numerous kinds of *marmi variegati*, or breccias, are mentioned for their beauty and high price. The breccias include the brilliantly-coloured material of Terra di Lavoro, not quarried for sale, the fine *Affricano* of Seravezza; the *Mischi*, or mixed marbles, of Seravezza and Massa, and many other varieties. They are all very durable, and homogeneous. Some of the most beautiful are so hard that their use is much interfered with. Amongst the breccias formed of fragments of highly crystalline limestone united by a siliceo-calcareous cement which has been acted on by adjacent veins of iron ore, or manganese, are some having a variegated appearance resembling the colours of the peacock's tail. They are called *paonazzi*. Some of the principal monuments of Florence afford evidence of the durability of the *Mischi* and *Affricano* of Seravezza. Many of the varieties are very retentive of polish.

To be associated with marble proper, for decorative purposes, is alabaster. The most celebrated varieties are the alabaster of Volterra in Tuscany, and that of the valley of the Marmolaio, near La Castellina. These are finely crystalline, of a pure white or delicately tinted colour, and beautifully translucent. This quality appears to be dearer at Florence than statuary veined marble,—costing 28*l.* per cubic "mètre" (of about 28 cubic feet English); but pieces so large as a mètre can seldom be procured. The agatised alabaster is remarkable for fine colour, usually reddish, and extraordinary translucency. It cannot be artificially coloured; whilst, in the clear varieties of the material, effects of colour, more particularly in yellow and dark tints, can be obtained by action of heat. The operation however requires considerable experience. The dark tints are obtained at a low temperature; while the yellow colour requires long-continued heat. In the alabaster districts, the manufacture of reduced copies of celebrated statues and buildings, for exportation, is largely carried on. Alabaster is easily carved; but practice is required "to give the proper polish and transparent effect to the finished work, by removing the *morto* or dead powdery mark left by the tool. This is effected by heating it with boiling water in a peculiar manner."

Several kinds of hard stones being found in Italy, and used in furniture, Florentine mosaic, and jewelry, and occasionally in the decoration of buildings, the jewelled decoration characteristic of styles of furniture, and even of architecture, in many parts of Europe, our own country included, was doubtless in its production and prevalence influenced thereby. Several kinds of quartz, the glassy, amorphous, translucent, opaque, and coloured varieties; jaspers of Giarreto, Barga, and Sicily; the calcedony of Monte Rufoli, and other materials, are used in Italy, both in the larger articles of jewelry, and for intaglios and cameos, as well as for the mosaics. The jaspers may be seen in several of the buildings of Florence. The light blue arragonite of Gerfalco is much used in marqueterie. One variety of ornamental hard stone is the Pietra Paesina, or Rimaggio stone, called also *ruin marble*, of Florence, from the markings having a fancied resemblance to ruined buildings. The *ciottolo*, of which the Rimaggio is a variety, is much used in the manufacture of cheap mosaic work at Florence.

The Serpentines and *Ophiolitic* rocks of Liguria and Tuscany are interesting both economically,

* See page 885, *ante*. † See p. 744, *ante*.

* "Esposizione Internazionale del 1862: Regno d' Italia. Catalogo Descrittivo pubblicato per cura del R. Comitato Italiano. 1. Mineralogia e Geologia (Prodotti Litoidei). Firenze; Tipogràfia Barbèra. 1862." 12mo. pp. 86.

"Catalogo Descrittivo pubblicato per cura del R. Comitato Italiano. 1. Mineralogia e Metallurgia (Minere e Saline). Torino. Tipografia Dalmazzo. 1862." 12mo. pp. xxiii. & 116.

and in the geological question of their origin. They are even preferred in Italy, to marbles, for small articles of furniture; but, for external architectural decoration, the commonly-supposed objections to the material have foundation in fact; and the best dark-green variety, or Prato black, "when kept for some years in imperfectly-ventilated lower rooms, undergoes considerable alteration," whilst, at Pisa, where the black marble of the Bagno alla Duchessa is used it is found quite equal to the white marble in durability.

Granitic rocks are largely quarried in Italy. Of the syenite of Baveno, a quantity amounting annually to the value of 16,000*l.* is produced. The material has been much used in Turin, as well as in other parts of northern Italy in public buildings. The eighty-two columns and eight pilasters in the church of St. Paul at Rome, and the large column of the monument of the Vergine della Pace in Naples, were obtained from the quarries at Monte Orfano. Basalt, lavas, tufa, peperinos, and igneous and metamorphic rocks generally, are used in many parts of Italy for common building purposes. In certain districts in the north, a kind of *phonolite* which splits into thin *laminæ* is used in preference to slate for roofing; as besides being cheaper, it is thought to resist wet and frost better.

Of the Schistose rocks of Italy, the most important materials are the slates, which are known as Lavagna stones, or *Lavagne*. The chief quarries are in the *eocene* rocks at St. Giacomo, near Lavagna, in the Genoese country; where they are about 150 in number, employing 1500 workmen, and representing a capital of about 16,000*l.* These quarries are considered to be a greater source of riches to the surrounding country than gold or silver mines. The slate is employed not only for roof-covering, but in slabs for apparently as great a variety of purposes as the slate of North Wales. From being employed polished, it has received the name "Poor Man's Marble." A table-top measuring 70 inches by 27 inches is sold for about 5s.,—the material being calculated at 2s. 8d, and the labour at 2s. 4d.; and there was a chimney-piece in the Exhibition, similar to what are sold at 4s. each. Slates are obtained also from the oolitic beds, at places near Seravezza. Besides roofing, they are used in ceilings; for which, slabs of about a yard square are laid on beams or joists, and afterwards plastered.

Of limestones, the principal kinds are the travertines, the compact limestone, or *alberese*, the saccharoidal or crystalline, the shelly varieties, and others. The rock called *Pietraforte*, an arenaceous limestone, was used in the older palaces of Florence, and is still employed extensively. One variety of oolitic limestone is used, principally near Trento, for making pipes for conveyance of water. The boring is effected by water-power. During the Italian Exhibition of 1861, the jury reported favourably of these tubes, as to their impenetrability to water under a pressure of 135 lb. to the inch, the highest that the testing apparatus allowed. Such pipes were once, say forty years ago, in use for the water-supply of Manchester, and perhaps some other towns: but they were considered very inefficient; and we have no doubt, have long ceased to exist.

The principal sandstone represented in the Exhibition was the siliceo-calcareous material (*arenaria macigno*) of the Apennines. The fine variety Pietra Serena is adapted only for internal ornament. It is exported to the East, to the extent of 800*l.* worth per month. The oldest and most famous of the quarries, those of Monte Ceceri, east of Fiesole, have been used since the Cyclopean walls of Fiesole were built; and the workings have now penetrated deep into the mountain, "forming a picturesque series of large chambers, with massive pillars supporting the roof."

Clays suitable for the manufacture of ordinary earthenware are abundant in Italy; but china-clay and other refracting substances are less common. The coloured earths, as the earth of Sienna, and umber, are of much value; and the permanence of the colours in pictures by the old masters, is considered to be one result of the local produce and industry. The improvement of the agricultural value of land by means of marl and other mineral manures appears to be receiving some attention. It may be worthy of note, for whatever opinion may be deduced, that several exhibitors of mineral fertilizers contributed soil from graveyards, "rich in nitrogen and phosphates." Boracic acid, used in pottery, glassware, dyeing, metallurgy, and in the manufacture of stearine candles, is largely extracted from the *lagoni* formed around the jets of vapour (*fumaroli* or *soffioni*) in the Tuscan Maremma, and by boring; and other chemical products are peculiar to the Italian soil. The manufacture of sulphuric acid from the sulphur of Sicily, is likely to be extensively carried on. But there is no coal, unless in Sardinia; and wood is scarce; though there are numerous deposits of peat and lignite, besides some of anthracite.

Italy is also rich in metallic minerals. They include those of iron, copper, zinc, argentiferous lead, gold, nickel, cobalt, antimony, mercury, and manganese; whilst iron pyrites, applied in the production of sulphuric acid from it, and graphite, are amongst the number. Sardinia and Elba are rich in metallic minerals; the latter island was anciently called *insula inexhausta metallis*. An important item in the products of Sardinia consists in slags, the remains of smelting operations carried on both in the middle ages and by the Romans. Similar refuse is turned to account in Elba. Though the iron ores of Italy are abundant, the want of fuel seriously interferes with production of the metal. The hæmatite (specular iron) of Elba is exported; and it is supposed that this exportation could be largely increased. In smelting, for the production of pig-iron, charcoal is used: the bar iron is some of it, produced in puddling furnaces heated by gas which is obtained from peat or lignite. Steel from Italy was formerly exported to England. It has been remarked that the production of steel in Lombardy could be largely increased were the gas puddling-furnace more generally employed. The importance to such a country as Italy, of recent discoveries of rock-oil which might afford the gas that would remedy the want of other fuel, is obvious. We shall not attach too much importance to the collections of products in the late Exhibition, if we say that proper study of them would veritably have diminished chances of future wars, like as the Exhibition of 1851 was intended to operate. This present summary of the Italian products, and our preceding notices of some of those of other countries, may have shown that many countries possess in their *strata* and soil, mineral wealth similar in kind to that which is popularly regarded as peculiar to Great Britain; but the economy which there is in supplementing the wealth through the avenues of commerce, is equally made apparent. Some description of fuel will probably be found or produced in the Italian peninsula, not as yet supplied; but meanwhile, the gain possible from the importation of fuel, or of exportation of ores, does not require pointing out: yet in going through the collections of products, the facts seem to be presented with a new light.

It would absorb too much space to specify the localities of the Italian mines, or to give any account of the foundries and manufactories which there are. They are numerous in the north of Italy, as at Genoa and Milan; but important industries exist at Turin and Venice, and even in Rome. Many of these establishments have been largely concerned in the construction of the rails and rolling stock of the railways.

The progress made by Italy in railways has been, under the Piedmontese rule, very remarkable. In April 1859,—when the first step to unite the country, then under seven governments, was taken,—a total of 2,592 kilomètres of railways throughout the peninsula, had been sanctioned; of which 1,472 kilomètres had been opened. At the period of the first meeting of the Italian Parliament in February 1861, or after the war, there had been sanctioned 3,494 kilomètres, of which 1,718 had been opened. Subsequently, up to the middle of this year, these figures have been again raised; so that, including all lines which may be regarded as authorised (some of which may be in Sardinia and Sicily,) but excluding lines in the Venetian and Roman provinces conceded to the Lombardo-Roman Company, they would amount to 6,637 kilomètres for the concessions, 2,252 for the total of lengths opened, and 1,828 for lengths in course of construction.

So that, it is not only for the works of her architects, sculptors, and painters, or for those of her workmen in decorative and ornamental art, that Italy has claims upon our attention.

In proportion to population, the combined industries of Sweden are very remarkable. The population in 1859 was but 3,787,735. That of Norway is not stated; neither have we any information from the commission for that kingdom. The most important of the minerals of Sweden are the iron ores. These are remarkable for their purity, especially from phosphorus. Their superiority has been attributed, besides to the circumstance just mentioned, to their being smelted exclusively with charcoal: though, if the facts noted in our former article, as to the Zollverein irons, for which coke has been used along with charcoal, be correctly stated, there would appear to be in this idea something more than has foundation. The greater part of the pig-iron is made into bar-iron in refineries with charcoal. Peat is used in some of the processes. It is dried, and otherwise fashioned like bricks, to be used as fuel. The other metals produced from Swedish ores are copper, which is highly valued for its purity from arsenic and antimony, silver with lead, nickel, and zinc. The Swedish Catalogue* has appended to nearly every title of an exhibited specimen of iron, the trade-mark. Such information will be of service to many purchasers and manufacturers in this country. The Bessemer method of making cast-steel from pig-iron, has been lately introduced into Sweden. The best English steel is made from the Dannemora ores. One of the Swedish contributors, V. Eggerty, of Fahlun, exhibited an apparatus for quickly ascertaining per-centage of phosphorus or sulphur in iron. The value of the Swedish iron was exemplified in the Exhibition by a portion of the bow of an iron steamer, which had been doubled by the steamer striking on a rock, without the accident being any hindrance to the safe completion of the voyage. A similar power in the Swedish iron of bending double without a crack, has been observed this year at Stockholm on the occasion of a comparison between two railway axles, whereof one was made in Manchester. The latter broke early in the experiment. The Swedish building stones include numerous kinds of granite, syenite, and porphyry, marble and limestone, and sandstone. Roofing slate is procured at some places in Dalsland. Beautiful porphyry is quarried at Elfdalen in Dalecarlia. In 1851, the quarries at this place belonged to the late King Oscar; and a vase exhibited in that year, was presented by the king to Prince Albert. The pedestal of the statue of Gustavus III. in Stockholm, is of this material; as also is the sarcophagus of Charles John in the Riddarholm Church. There is some useful information in the Swedish Catalogue, given by one exhibitor, as to the weight per cubic foot, and the absorption of water, of forty six specimens of Swedish rocks. The commoner buildings in Sweden are covered with shingles. Bundles of these were exhibited, along with the model of a roof. The wood now generally used is that of the *Pinus sylvestris*. The wood is split not thinner than nine pieces to an inch; and the pieces are steeped in sulphate of iron or copper to preserve them, and render them fireproof. The description of the method of laying, speaks of "beginning from the right and continuing towards the left," so that "the thinner part of a following shingle always covers the thicker edge of a foregoing;" which does not seem at all to resemble the method of laying plain tiles or slates. They are said to be perfectly waterproof, and to last at least fifty years. The total cost of shingles, laths, "rafts," nails, copperas, and labour, will be about 1½d. per English square foot.

The catalogue of the Russian Division of the Exhibition,—which appeared, like so many of the catalogues, too late,—shows that the division included specimens of most kinds of metallic and other minerals. The prices of many of these are given in English money. Some of the articles in porphyry and jasper, contributed by the Government, have enormous prices appended to them. The column in grey violet-coloured Korgonsk porphyry with bronze base and capital was priced 631*l.*; and the candelabrum in Kalkansk jasper had the trifling figure 2,285*l.*, having we hear, taken ten years to work. A vase in the Korgonsk porphyry was priced 1,015*l.* The graphite exhibited in this division, has been likened to that of the Borrowdale (Cumberland) mine for purity. May the calculation of its value prove correct!

There are many products of other foreign countries, besides those of the British colonies and India, which doubtless would claim notice; but we must content ourselves with repeating that all the products should be represented in permanent museums in each country, with information attached. Might we not reasonably expect to find at every foreign embassy or consulate in London, such a museum, and to have access to the information as to properties of the materials, and cost, including conveyance to this country; and might not this country well afford the cost of like museums of its products, abroad? Surely, through extension of the knowledge of resources of each country, there are the means of gaining objects equal to any that are sought for by diplomacy; but, for such information as we have alluded to, periodic international exhibitions, howsoever managed they may be, cannot suffice.

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ON COTTAGE BUILDING, AND SANITARY APPLIANCES.

AT the close of Mr. Taylor's paper, read at the Society of Arts, and printed in our last :—

The Chairman said that Major-General Tremenheere, who was to have presided that evening, was unable to leave his home, owing to the illness of his son; which they regretted, as well on his own account as on that of the meeting; the subject of the paper being one in which that gentleman took great interest. It was difficult, indeed, to exaggerate its importance; and it was fortunately one that just now engaged the attention of the promoters of social economy. It was one to which their late lamented Royal President addressed his active and practical mind; and it would be remembered that he erected a pair of model cottages near the Exhibition of 1851, which had been rebuilt, and were now to be seen on what was Kennington-common. The distinguished friend, also, of the labouring classes of this great metropolis, Mr. Peabody, was so impressed, during his long residence in England, with the growing and urgent necessity for better and healthier habitations for them that, with a munificence beyond all precedent, he placed in the hands of trustees the sum of 150,000*l.* to be devoted, if so determined, to this benevolent object. He (the chairman) having, within a few days, had occasion to see that gentleman, informed him of the subject of this evening's discussion, when he expressed his regret that in consequence of the painful illness under which he was then suffering, it would be quite out of his power to be present, but he should be glad to receive particulars through the press.

Mr. J. Bailey Denton said he should be sorry in any way to depreciate the paper just read by Mr. Taylor on this very important subject; but as he represented not the architectural interest, but that of agriculture, they must allow him to make a few remarks—not so much upon Mr. Taylor's paper as upon the subject generally. The paper was a very ingenious one; and he must admit that the drawings by which it was illustrated were most explicit; but there was to his mind one very manifest omission, and that was the consideration of the cost of the structure. Very much had been said and written on this subject by a great many people for many years past; and yet at the present moment we were really as much at sea, as to what description of cottages we should build, as we were fifteen or twenty years ago; and he could not but feel that the paper had not dealt with the question which he thought most of those present had come to hear. The cost of cottages resolved itself practically into the rent to be paid for them, and it was no matter of congratulation to be able to build cottages that labourers could not pay rent for. Much had been endeavoured to be done by prizes and the efforts of various societies; but it was a fact that not one of those prize designs had provided for buildings that could be erected for the money which was stated as a necessary condition to the premium offered. Representing, as he did, a company which was employed very largely in the building of agricultural property, and in ascertaining the lowest prices at which, with due consideration to the sanitary requirements of the day, labourers' cottages could be built; and having himself inspected a great number of drawings, plans, and specifications for them; he was there to confess that they had not been able to build cottages for which the farm labourers of the country could pay a rent which, in itself, would give an adequate interest on the capital expended. The average cost, at the present moment, of cottages with three rooms, with water supply and the necessary fencing, was 260*l.* a pair. He was speaking, not merely of his own experience, but advisedly, from the experience of those who were largely engaged in building; and as it was necessary, in order to encourage the building of cottages, that they should give a return of 6 per cent. upon the outlay, the rent would amount to 15*l.* 12s. per annum, or 7*l.* 16s. per cottage. Now, the utmost that a farm labourer could afford to pay was limited to one-seventh of his earnings; and, therefore, taking the average agricultural wages at 10s. or 11s. per week, the rent which could really be afforded was not more than 1s. 7d. or 2s. per week, which was equal to about 5*l.* per year. Now, inasmuch as 6 per cent. upon an outlay of 130*l.* per cottage represented 7*l.* 16s. a year, it was clear that there remained 2*l.* 16s. yet to be made up from some source in order to encourage builders to erect these cottages. That 2*l.* 16s. might fairly be paid, partly by the farmer who employed the labourer, and partly by the owner on whose estate the cottages were built, the farmer employing the labourer having the advantage of the man living on his farm, could, it was admitted, pay something towards the rent; and if they assumed that he could afford to pay 1s. per week, or 2*l.* 12s. a year, there would yet remain something for the owner to pay to make up the deficiency. 260*l.* a pair for cottages was too large a cost, and it was an object worthy of this Society, and of the country at large, to endeavour to reduce the expense from 260*l.* to about 200*l.* a pair. If they could succeed in doing that, there was very little doubt they would be able to build cottages for the poor which were suitable in all particulars. As an illustration of the difference that existed in the various designs that had been placed before the world as being worthy of adoption, he might mention the fact that the cubical contents of these cottages varied as much as from 7,000 to 12,000 cubic feet. At some future time, he proposed laying before the agricultural community a tabulated statement of all the cottage designs that had received prizes of various kinds, and the extraordinary difference between them would strike any one who had paid any attention to the subject; but no point would strike them more forcibly than the fact that none of those designs could be built for anything like the price estimated. He thought the essential object to be kept in view was a reduction of the cost of building cottages to a sum upon which the labouring population of this country could afford to pay a fair rate of interest in the shape of rent. Unless they did that, they practically did nothing; and he hoped the Society would accept what he had, with some diffidence, proposed; viz.,—the offering of two prizes for cottages that should be *built*—not merely designed, for there was a great difference between designing and building—a pair of cottages which should be built for 200*l.* It might be asked why he had put them at that sum? The reason was this. In all the designs that had received commendation or prizes, there were none the estimates for which exceeded that sum; but he challenged Mr. Taylor, whose drawings were so explicit, and whose statement was so interesting, to produce a pair of his cottages built for 200*l.*,—subject, of course, to one condition, that they should be built substantially, and in accordance with the rules of the Enclosure Commissioners, who had certain regulations as to substantiality. He would ask Mr. Taylor what his estimate was for a pair of cottages built upon his plan?

Mr. Ebenezer Clarke had listened with much pleasure to the remarks of Mr. Taylor in reference to the cottages he proposed to build; and practical men interested in this subject must feel indebted to that gentleman for many of the suggestions he had made. He (Mr. Clarke) was happy to state, as bearing upon the remarks just made, that he held a contract, which was now in course of execution, for building cottages as low as 225*l.* per pair, which were of larger cubical contents than those described by Mr. Taylor. The front room was 12 feet by 10 feet, the back room being about the same size, with a wash-house at the back, and containing a capital oven, copper, sink, and dresser, and a good water-closet. There were two good rooms upstairs, and there was a porch in front. A pair of cottages upon this design had been placed opposite the eastern dome of the International Exhibition during the present year; and at Walthamstow there were sixteen pairs of cottages now being erected at the contract price he had stated. The cost of those cottages, including the freehold of the ground, would not exceed 130*l.*; and a rental of 2s. 6d. per week would give 6*l.* 10s. a year as the interest upon that amount. But it was said the landlord would expect more than that. Even if 3s. 6d. per week, or 2*l.* 12s. additional for rates and repairs, were required, for that rental they might have cottages within five miles of London which could be let to pay a fair remuneration upon the outlay. By this means a great difficulty would be overcome. Mr. Scratchley had laid down a good principle for the purchase of cottages by labourers. He had proposed that some of the money subscribed to the savings banks should be appropriated, at four per cent., to the purchase of labourers' cottages. If a cottage could be bought for 100*l.*, the tenant would only have to pay four per cent. interest as rent, and to insure his life for 100*l.*; so that, by the payment of 6*l.* a year, the cottage would be his in fourteen years, with the advantage that, if he died in the first year, he would be able to hand over the cottage to his widow as an annuity of 10*l.* for life. With regard to cottages in the country for agricultural labourers, there might be some difficulty; and he thought a lower price than he had mentioned would be a necessary condition. With reference to Mr. Taylor's system, it was a question with him whether country bricklayers would be able, generally, to carry out the designs, and to use the materials recommended by that gentleman, so readily as to build with them substantially as they were accustomed to do under the old brick-and-mortar system.

Mr. Charles Bagnall could confirm the remarks of the last speaker, inasmuch as he had almost completed twenty cottages in Yorkshire upon the plan referred to, at a cost for the smaller ones of 160*l.* the pair, and for the larger ones of 200*l.* per pair. Those cottages originally contained only two bedrooms, which did not admit of a proper division of sleeping apartments for a family; but at a cost of only 10*l.* he had added another bedroom, and then the cottages had been rendered really suitable habitations for a family.

Mr. Robert Rawlinson had listened to the paper with great interest; but, looking to the diagrams before them, it occurred to him that there would be some difficulty in getting country bricklayers to put these materials together. He differed from Mr. Bailey Denton as to the question of labourers' cottages paying or not paying. He had studied this subject for the last twelve or fourteen years, and he held that it was not a question of mere pounds, shillings, and pence, as regarded the payment of rent. It was a question of moral and sanitary importance to the whole nation, and the time must come when they would have to look upon it in a national spirit; for they were now beginning to understand upon what principles society was based, and how they could best be enabled to insure its permanence and its safety. The late Royal President of this Society, with that far-seeing intellect for which he was so distinguished, regarded this question as one of national importance, when he placed before the public those model cottages at the Exhibition of 1851; and that great man who now sat upon the throne of France had also seen and appreciated it. He appreciated the fact that the poor were in this respect powerless to help themselves; therefore, the movement must be made by those above them; and he (Mr. Rawlinson) said advisedly that, let them work the problem as they might, they must not split straws about plans and cost: but the time was come when they must understand that a community of people must not be allowed to grovel in the mire like the lower animals, or to exist as they did in many parts of Ireland at the present time, where human beings herded together with the brutes; and being born as brutes, and living as brutes, how could we expect them to feel otherwise than as brutes? In this wealthy country he could take them to towns of large populations, where the artisans were earning from 35s. to 40s. per week, and yet could get nothing more than room tenements to put their families into; not that they were unable or unwilling to pay for better accommodation, but simply because nothing better could be obtained. How, then, could the working man raise himself in the social scale? The poor could not build for themselves, and it must be a national concern. It was argued that the question resolved itself into one of rent. He said no; and even if it did, if they worked out the problem in all its elements, it would be seen that the cost came upon the public at large, who had to pay for the neglect and misery, directly and indirectly, by pauperism, by vice and crime, and by a depreciated human race. They paid it directly in the shape of provisions to be dispensed by the relieving officer. Medical men could point to rows of cottages from which came all the fever that infested a neighbourhood, and into those cottages the mass of the money went, which was expended from the poor-rates every week; and in some cases the owner of the houses, living at one end of the row, would watch for the visits of the relieving officer, and pounce upon the money for rent. Such an evil as this could only be met as a national question at least; and, if they took a Christian view of it, as a Christian question. There stood rows of habitations in which it was impossible to live without the occupants sinking in the social scale. An artisan coming from the country into a large town was obliged to take his wife and young family into room tenements, where it was impossible they could live healthily, and they were stricken down by typhoid fever: it ended in either the widow following her husband to the grave, or with her children becoming permanent inmates of the union workhouse. The hollow bricks which Mr. Taylor had recommended were no doubt valuable, but he regretted that that gentlemen had taken out patents for inventions of this character: he thought it doubtful whether they would be valid, for he himself had used hollow bricks years ago. He (Mr. Rawlinson) took credit for some ingenuity, but he could con-

scientiously say he had carefully eschewed patents; for he knew, by experience, that it was very seldom indeed that patents paid; and, looking at the question, he could see no elements of remuneration arising from the patenting of articles of the description brought before them this evening; but if Mr. Taylor found it otherwise in his practice, that was an answer to him. The advantage of concrete walls, as regarded economy, would no doubt be felt in many parts of the country, and the merits of the damp-proof course could not be denied. He had made perforated bricks as early as 1845, but without a patent; and, as regarded the tile floor, it was very ingenious, but was not a plan he should be inclined to adopt. There was an old proverb that they should "never make holes for rats, except they left holes for cats." Now, there was plenty of room for rats and mice in these holes, but not sufficient for cats. Some remarks had been made as to the roof being perfectly tight upon Mr. Taylor's plan: he hoped that referred only to its being water-tight, because of all curses in a house an air-tight roof was perhaps the greatest. The same might be said of air-tight walls and fittings, which might be made so perfect as to become the perfection of bad construction. He had been in houses where the carpentering work was so perfect as to amount to a positive evil from the entire prevention of anything like healthful ventilation; and, on the other hand, if mechanical means of ventilation were provided, they were apt to be closed by the occupants of the house through some fancied discomfort in the way of draughts; and, therefore, they were often obliged to disguise the means of giving proper ventilation to dwellings. He hoped this Society would give all the aid in its power—not that cottages should be built which the poor man was able to pay for, but such as would enable him to live as became a Christian, and properly to perform his duty to society.

Mr. Geo. Godwin, being called upon by the chairman, observed that he had nothing particularly new to add to what had been said, but would express the very strong conviction he felt, no doubt in common with many others present, of the immense importance of this subject; and supposing it turned out that dry, warm, well-drained, and properly-ventilated cottages could not be built for the labouring classes at such a sum as they could pay a proper rent for, he said boldly they were not sufficiently paid for their labour. They were not getting out of the land that amount of sustenance, and that provision of protection from the weather, which, as human beings, they were entitled to receive. His own notion was, that residences for the poor could be built to pay; and he thought they owed a debt to Mr. Taylor for the amount of ingenuity and intelligence which he had brought to bear upon this subject; and though they might not see at first sight that the means suggested would materially cheapen the cost of cottages, it was obvious that the damp-proof course here introduced was a most important building material; and he was quite sure, as it became known, it would be extensively used. He thought the difficulty with regard to the other materials was that they could not get workmen without education to use them properly. Many years ago he had assisted the late Mr. Hitch, of Ware, in making known concrete and hollow brick walls for cottages; the hollow in the wall being filled with concrete. It was a very ingenious plan; stronger, but probably not so cheap as that of Mr. Taylor. He (Mr. Godwin) had, however, found it quite impossible to get builders to take up the plan; and it gradually died out, although walls of even 6 and 9 inches thick, built in that way, had stood in a perfect state for twenty years; effectually resisting the damp, and forming altogether most efficient work.* That was the difficulty which all inventors had to strive against. He had no doubt where materials for concrete were plentiful in many parts of the country, and where these bricks of Mr. Taylor's could be put into the hands of intelligent master-builders or foremen, very good and cheap houses could be constructed with them. It had occurred to him to witness, both in town and country, the frightful condition in which the great bulk of the labouring population lived, agricultural as well as manufacturing. Many individual landlords were doing much to remedy that state of things. The Yorkshire Agricultural Society and many others had given prizes, and were doing all they could to advance this object; but the field was so enormous that the efforts of a few individuals were almost useless. They scarcely touched the evil; and, at the present moment, the great bulk of the labouring population were living in such a way that a high state of health was impossible,—in such a way that evil courses might be viewed as the results of the condition in which they lived, the effects of which no amount of after education could counteract. All moral perceptions were blunted in the minds of the children (the crease was made in the damp paper), and, do what they would, with the present system of national education, they could not remedy the damage which was brought about in infancy. What was the result of all this? The habitations were tenanted by a population sunk in ignorance and moral degradation. In the courts of Drury-lane and Gray's Inn-lane, as elsewhere, there were thousands of human beings but little better than Pagan savages: they knew nothing that was right; and those were the class—the dangerous class—who were at the present time making themselves known and felt in our public streets. He had said thus much to show that the subject before them was one of the greatest importance: he felt that they were indebted to every gentleman who brought his intellect and practical experience to bear upon it; and he moved a vote of thanks to Mr. Taylor for his paper.

Mr. Edwin Nash remarked that no material had been shown by Mr. Taylor as that which he intended for the quoins of his building; but he presumed he had some arrangement for that purpose which would match with other portions. In some of Mr. Taylor's cottages he had seen that ordinary bricks were employed at the quoins. He thought that was an imperfection, because the quoins of a building were the parts which generally held the greatest quantity of moisture; and in plastering a new structure internally, the difficulty was to get the angles of the walls dry at the same time as the other portions. With regard to the damp-proof course, he thought that, to be effectual for the purpose for which it was designed, it ought to be placed at a not less distance from the ground than 18 inches. The place where the splash of the rain went against the external wall was generally the dampest place; and if this damp-proof course were placed within a short distance of the ground, and the rain-splash went above it, the end it was intended to answer would not be gained. There was a tendency in the surface of the ground round a building to become relatively higher by the lapse of time, and that which had been 18 inches from the ground originally would, in forty or fifty years, be below the level.

Mr. Liddle remarked that he was disappointed at the course which the discussion had taken. He felt, as all of his profession must feel, a deep interest in the well-housing of the poor. He resided in a district of the metropolis where a large number of the houses had been taken down for street improvements and railways, which had had the effect of dislodging a large amount of the poorer population, and thrusting them closer and closer together into places inaccessible to any persons but the relieving officer and the police, which caused their health and morals to be so fearfully deteriorated. He was in hopes that some practical suggestions would have been thrown out as to how these great evils were to be met; but the discussion had, for the most part, turned upon the cheapness with which cottages could be built for farm labourers in the country, leaving untouched the great question of providing for the moral and physical condition of the crowded masses of the working population in the metropolis. It was a remarkable fact that whilst the population was largely increased, house accommodation had decreased: the consequence was that more persons were crowded into the houses which remained accessible to the poorer classes; and where there were formerly eight, there were now, on an average, at least ten persons in a dwelling. He sincerely hoped that at some future time this question would be taken up with the seriousness which its importance demanded.

Dr. Greenhow expressed a similar disappointment to that of the preceding speaker, at the course which the discussion had taken. He viewed the question in a different light to most of those who had spoken upon it. He felt that the great point was to build cottages especially with reference to the health of the inmates; and he hoped to have heard this evening of some fresh building appliances which would conduce to render the cottage in town more healthy than they had been hitherto. With regard to the size of which cottages should be built, Mr. Taylor had given the dimensions of 12 feet square for the rooms, but he had omitted to state the height, whether 8 feet or less. Even that would afford small cubical space for a room which was occupied by a family during the daytime. The rooms above being covered by a partially slanting roof would have a still less cubical content. He did not care about the cost of the cottages; but he would say emphatically, having had long experience in those diseases which emanated from living in confined breathing spaces, that cottages of the dimensions stated, supposing the rooms to be 8 feet in height, would be unwholesome, and would tend to those diseases of the lungs which arose from living in an impure atmosphere. With regard to ventilation, the only provision that he had heard mentioned in the paper was the beautiful stove of which they had had a description, and he inferred that such stoves were intended to be placed in the cottages spoken of, though they appeared to be too expensive for such a purpose. With that exception, he had heard of no means for providing ventilation. He did not offer these remarks in disparagement of the paper, but only as bearing upon the important subject which they were met to discuss.

Mr. C. Asprey expressed the interest he felt in this subject, and his surprise that the influential classes of the metropolis had not taken it up more warmly; if they had done so, he thought they would have met with great support, particularly if they had only laid the matter before men engaged in business. He believed the labouring populations of large towns suffered in respect of house accommodation tenfold more than those in the country; and he only hoped this paper and discussion might be the forerunner of some movement which would be beneficial to the London poor. He was an employer of labour in various forms, and he had long felt that the working-classes, with means of paying for better dwellings, were unable to obtain healthy and comfortable habitations in London. Looking to the miserable courts and alleys of Drury-lane, for example, the space now occupied by those wretched tenements might be made available for the healthy dwelling of many more families than were now located there in filth and squalor, if the houses were built upon a proper principle. He hoped there were liberality and riches enough in this great city to afford the means for furnishing the poor man with a comfortable home, so that he might bring up his family in a proper way, with greater attention to their morals than was at present the case. There were many who, like himself, would be willing to aid in forwarding this great object; and in order to make a start, he would lay down 100*l.*, either as a gift or at a low rate of interest; and if a thousand others did the same, they would at once have a fund which would be the means of doing a vast amount of good in this important matter.

Mr. Seddon said, having seen Mr. Taylor's inventions in action, he was happy to bear his testimony to their efficiency as far as he could judge. These were materials with which cottages and larger dwellings could be built at a much cheaper rate than before; and, as regarded sanitary appliances, the plan introduced by Mr. Taylor must be admitted to be a great improvement upon the old system. With respect to the getting these new materials properly put together by country bricklayers, he would state that he found no difficulty in getting the work done. He had used a great many stoves of the description brought forward this evening; and although the one exhibited was ornamental and expensive, the principle had been extensively adopted in barracks and Government offices, in a cheaper form. The great difficulty with regard to ventilation was, where to let the air in; and it was of no use to let fresh air in without providing a means for the egress of the impure air. That was fully provided for by Mr. Taylor's stove; and where the air could not be brought in heated, it must be admitted above the level of the head, which could be done in any volume required. If there was sufficient egress for the vitiated air, the apartment would be thoroughly ventilated.

Other gentlemen having spoken, the chairman put the vote of thanks, which was passed.

Mr. Taylor, in reply upon the discussion, said Mr. Denton had expressed his disappointment at no plan having been brought forward for building cottages for a less sum than 260*l.* a pair; but he was answered in that respect by the gentleman who followed him, who declared that he was now engaged in erecting cottages at 225*l.* the pair. If he (Mr. Taylor) had brought forward any specific price at which the cottages he described could be built, he should probably have been met with Mr. Denton's very proper remark, that it was only an estimate, which was not always to be relied upon. He had not come before them to advocate any particular plan of labourers' cottages, but merely to show them how the walls, roofs, paving, and

* See first additional supplement to Loudon's "Encyclopædia of Cottage Architecture," p. 1257.

other things, might be built better and cheaper than they had been hitherto. He had shown that the materials for these portions of the building could be furnished at half the cost of brickwork. With respect to the dimensions of the room, a dozen medical gentlemen would probably hold as many different opinions as to what was absolutely a necessary size for a healthy apartment. With regard to the damp-proof course, one gentleman had objected that it afforded facilities for the encroachments of vermin; but in his practice he had never found this inconvenience occur. Another gentleman had spoken of the necessity of having the damp-proof course a sufficient distance from the ground to be out of the reach of the rain-splash. In the plan he had placed before them, he had shown the course in the position for its most economical adaptation, and it was at the option of the builder how high up the wall he chose to put it. He might mention, with regard to the alleged difficulty of getting ordinary workmen to use these materials, that his plan had been experimentally adopted for military huts at Chatham, and the materials were very readily made up by the sappers employed for the purpose. The walls for huts of 40 feet long were only 6 inches thick; and the reports as to the durability of that plan of construction were so satisfactory to the authorities that they gave orders for the erection of huts of 200 feet and 300 feet upon the same plan at Hounslow.

THE DEEP SEA-BED OF THE IRISH ATLANTIC OCEAN.

IN the course of the recent survey of the sea-bottom between Ireland and Newfoundland, by her Majesty's ship *Porcupine*, under the command of Mr. R. Hoskyn, very interesting particulars respecting the inhabitants of the deep sea were ascertained. The primary object of the survey was to ascertain the most gradual slope of the bed of the ocean; or, in other words, the route most suitable for a line of telegraphic cable. But a secondary one arose out of this; namely, to ascertain the nature of the sea-bed. Two routes have been selected for examination. The first, or Galway route, presents the greater facilities. For the distance of 160 miles due west from Cashla Bay there was found to be a gently undulating sea-bottom or terrace, having the decline of an ordinary beach. From 100 to 185 fathoms of water rolled above it; the intermediate soundings being 20, 65, 68, 74, 76, 82, 105, 135, and 165. At the western extremity of this terrace rises a bank which is but little more than 80 feet below the surface of the ocean. Beyond this is a descent of 700 fathoms in ten miles, when the telegraphic plateau is gained—a vast submarine plain, stretching thence to the banks of Newfoundland with a tolerably even depth of two miles of water.

The second route starts from Valentia. A valley 525 fathoms deep is first met with. A ridge twenty-five miles in width rises from the opposite edge of this valley, which ridge is between 195 and 230 fathoms below the surface. At the western extremity of this the bed again declines till the bottom of a second and much deeper valley is found. In this sea-valley the waters are three miles in depth. Beyond this a gradual rise takes place till the telegraphic plateau is reached.

The various objects brought up from the ocean-bed by the sounding machine and dredge, have been placed in the hands of Professor King, of Queen's College, Galway, for examination by the Lords Commissioners of the Admiralty. It has been a common supposition that life could not exist at any very great depth in the ocean, on account of the immense weight and pressure that two or three miles' depth of water would present. But this theory has been gainsaid. Professor King states his belief that his report on the subject will be prepared in the course of this winter, and in the interval has issued a preliminary notice of the organic and inorganic objects obtained from the soundings. From this it appears that the surface of the deep sea-bed is one vast sheet of *foraminifera*, and other minute structures, whose functions are to clear the waters of the ocean from all mineral and organic impurities. There are perforating mollusks living at great depths; but Professor King does not entertain apprehension that they would bore into a telegraphic cable. He inclines to the belief that the organic accumulations to be expected on foraminiferous bottoms would, in the course of a very few years, completely encrust it. The wide bank discovered 160 miles off Galway, called Porcupine Bank, consists of siliceous sand and coarse gravel, with the addition of considerable quantities of the *débris* of Nullipores, shells, and other organisms. Pieces of rock, some 3 or 4 inches in diameter, are found with fresh specimens of *Truncatulina*, and various genera of Bryozoa adhering to the upper surfaces of them, showing that the water at the comparatively inconsiderable depth where they live is not much affected by storms. Several fishes were brought up by the dredge from the bank surface, two of which had not hitherto been recognized as British; and about fifty shells, besides sponges, star-fishes, sea urchins, and hermit crabs. The orbulo-globigerinous mud brought up by the sounding machine from a depth of 340 fathoms, contained specimens of a *Pecten*, an *Arca*, and a *Pectunculus*; also specimens of *Trochus millegranus*. The most unexpected fact, however, come upon up to the present date of examinations by the professor, is the finding *Discina* (*Orbicula*), in mud from the eastern side of the three miles deep submarine valley, 1,240 fathoms below the surface of the waters.

THEATRE ROYAL, WESTMINSTER.

PHILIP ASTLEY'S name in connexion with a circus has lasted exactly a hundred years to a week. The cavalry soldier began his venture in a Lambeth field in 1763, and set up his first wooden enclosure on the site of the present theatre in 1773, building it partly, according to Mr. Timbs, with 60*l*., the produce of an unowned diamond ring found on Westminster Bridge. This energetic individual (who told his horn-blower, when he found him "counting the bars" till his turn came in the overture, that he paid him to play and not to "rest," and wouldn't have it) built nineteen theatres, including the original Olympic in Wych-street. Astley's has been burnt down three times, and rebuilt; the fire on the last occasion, in 1841, leading to the insanity and death of Ducrow, the manager, whose skill and grace as a circus-rider have not been equalled since. And now Mr. Boucicault has quietly wiped out the circus, and under the title of "Theatre Royal, Westminster" (a misnomer, by the way, let us say with all gentleness), has prepared for the public a very commodious interior for the enjoyment of stage plays.

It is difficult to recognize the old outlines. The floor of the pit has been lowered about two feet (so that the old foundations of the iron columns supporting the boxes are seen, cased, above ground): the front of the stage, with new proscenium of less width, is brought forward 9 feet, and a balcony is thrown out from the dress circle 16 feet, so that the actor and the spectator from this part of the house are brought 25 feet nearer than they were formerly. Above the dress circle is a large amphitheatre, and behind that the gallery. A shallow balcony, formed by an open balustrade, with lights in front of it, occurs at the bottom of the amphitheatre, and is filled with plants. This prevent the occupants of the latter from looking down on to the balcony below, and would hinder the descent of an orange peel, should mischief jerk it. The seats in the dress balcony give plenty of room (about 4 feet of depth, including the chair), and are very comfortable. The admission to these is the highest, and is yet but 3s.; the entrance-money to pit-stalls and amphitheatre, unless previously secured, being 1s. 6d. The pit, with wide seats, is admitted to for 1s. Care seems to have been taken to arrange all the lines of seats so that the floor of the stage may be everywhere commanded. A large sun-light burner, slightly below the line of ceiling, takes the place of a chandelier, and is screened to some extent by a fringe of glass drops. The only peculiarity about the float is, that extra light is obtained in the centre, to the extent of 7 feet or 8 feet, by having the burners there closer together.

Mr. Boucicault, writing of his views on the subject of the ventilation of theatres, says:—"The systems of ventilation in theatrical use are all defective, nor have we been able to introduce that which alone is perfect. Underneath the entire floor of the pit should be constructed a chamber, lined and floored with galvanized iron, to keep out the damp. This chamber is in connexion with the roof by means of four large air-shafts and four open fireplaces with their respective flues. The flooring of the pit forming the ceiling of this chamber is laid with open joints, thus admitting either cool or warm air, as the chamber below is heated by the fires or cooled through the air-shafts. The wide extent over which the cool or warm air is thus admitted precludes all possibility of draught, and the process in either case is insensible. The ceiling of the auditorium should be made of wire gauze, such as is used in window-blinds. It is stretched on a strong wire frame, which has been previously modelled into the proper form—that is, a very oblate dome, or an inverted saucer-shape. This ceiling will take decoration like canvas, and is opaque when lighted as usual from below, or may be rendered transparent by lighting it from above. It is suspended by strong rods from the roof timbers, and guyed steadily in its place, whence it can be let down to be redecorated or cleaned, or taken up without trouble. Over its centre surface above, and between it and the roof, is spread a light blue woollen cloth, which is perforated by the suspending rods, kept stretched by them, and works up and down upon them. This damper is raised by lines, or allowed to fall as the ventilation may be required more or less in degree. If allowed to lie on the wire gauze, it stops the airway altogether."

We need not now stop to discuss these views, as in the present theatre the manager was not able to carry them out. There are flaps above the ceiling which open to the external atmosphere when needed.

The decoration of the auditorium is confined to flat tints, chiefly white and sky-blue, panelled with gilt mouldings, and smartened by means of artificial flowers proceeding from cornucopiæ on the front of the balcony. The background of the boxes is pink. A space at each end of the orchestra is to be filled with flowers and shrubs around a small ornamental fountain.

Considerable improvements have been made upon the stage, and the ground below it has been removed so as to get a depth of 19 feet for machinery and scenery, the bottom being concreted to keep out the water. The old painting-room having been removed to make way for new green-room and dressing-rooms next New Palace-road, where a new stage entrance has been opened, a hanging floor or bridge has been erected at the back of the stage, balanced with weights, with two painting-frames, one on each side of it. Under special circumstances this floor can be brought down to the proper level to form part of the scene. The works have been chiefly executed by Messrs. Patrick & Son; Mr. R. W. Griffiths being the architect.

Of Mr. Boucicault's intentions for the future, such as improved entrances and extensive lounging and refreshment-rooms on the site of the houses nearest Westminster Bridge, we need not at present speak. He has a lease for forty-four years, and holds under the Archbishop of Canterbury.

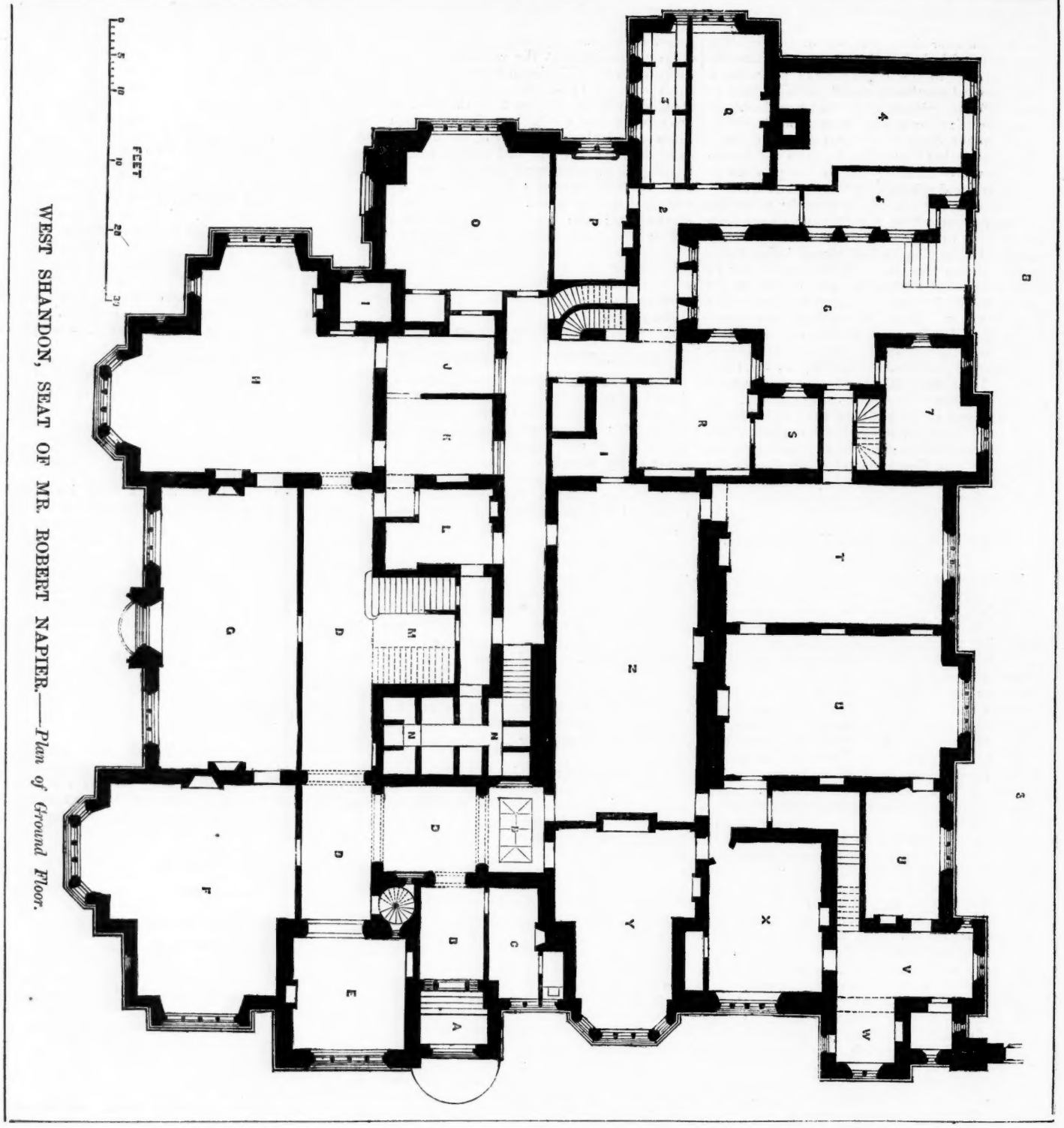
The house opened on Monday, the 22nd, with "Parents and Guardians," and "The Siege of Lucknow."

STAINED GLASS.

Glasgow Cathedral.—Another window has been fixed in its place in the choir, thus completing the decoration of that part of the structure. It represents "The Resurrection," and is from the designs of Schraudolph. In the centre of the window is seen the angel who has rolled back the stone from the door of the tomb. He is gazing upwards at the figure of the Saviour, who rises by effortless will, in robes of light, his face turned heavenwards; in his right hand the palm of victory—victory over sin and death. At the feet of the angel are two of the soldier guardians of the tomb—one insensible: the other, in terror, covers himself with his shield. Beneath is the simple text, "He is risen." On either side of the central picture, figures of angels bear the texts, "Glory to God in the highest," and "O Death, where is thy sting? O Grave, where is thy victory?" The tomb is of a circular form, allusive to the earth. By next week the lancets of the former Lady Chapel will be completed by the erection of two painted windows behind the tomb of Bishop Law. These windows represent St. Stephen and Timothy. They are by Henry Ainmiller. Another window has arrived, which will be erected in the nave shortly. The subject is "Noah," and the artist George Fortner.

WATER-COLOUR PAINTERS' LANCASHIRE RELIEF FUND.

THE water-colour artists have responded handsomely to the appeal made to them; and it now rests with the public to turn this kindness to account. In the German Gallery, New Bond-street, will be found 300 water-colour paintings, including works by Messrs. Harrison Weir, Dillon, Leitch, Wehnert, R. Redgrave, R.A.; Percival Skelton, R. Tucker, Louis Haghe, McKewan D. Cox, jun.; Vacher, W. Cave Thomas, J. H. Mole, Henry Warren, Mrs. Jones (of Pantglas); W. Bennett, Cuthbert Bede, H. K. Brown, James Fahey (who is acting as honorary secre-



WEST SHANDON, SEAT OF MR. ROBERT NAPIER.—*Plan of Ground Floor.*

tary); C. W. Cope, R.A.; F. Goodall, A.R.A.; L. W. Desanges, Edmund Warren, Alfred H. Taylor, Henry Tidey, W. Telbin, Edward Corbould, E. B. Jones, Absolon, H. O'Neill, A.R.A; and many others.

As we have already mentioned, subscriptions of one guinea each to the full value of the works will be raised, and each subscriber will be entitled to one share in the allotment of the paintings for each guinea subscribed. The whole process, less working expenses only, will be paid over to the committee for the Lancashire Relief Fund. No time should be lost in carrying the scheme through.

THE LATE MR. JOHN WEALE, ARCHITECTURAL PUBLISHER.

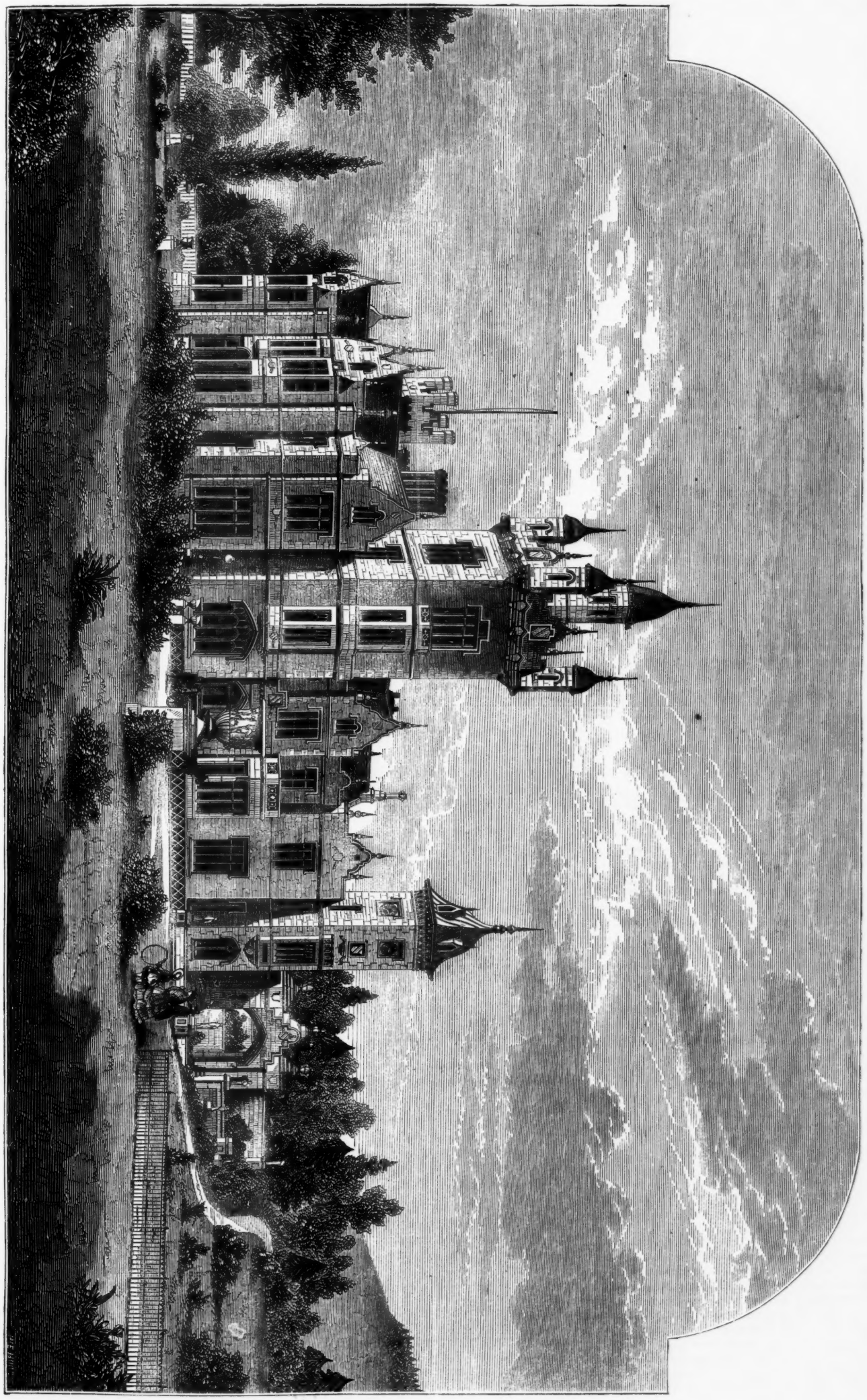
Many of our readers will hear with regret of the death of Mr. Weale, of High Holborn, who has been for many years connected with architectural publications. Some remarkable "Statistical Notices of Works on the Fine and the Constructive Arts," circulated by Mr. Weale last year, and to which we drew attention at the time, showed that while his career had been a struggle, it was also a labour of love, and so had brought its delights. He had expended at his own risk in publications 209,502*l.*, and at the risk of authors, 29,695*l.* On his admirable "Rudimentary Series" alone he had risked about 50,000*l.* This, as we have heard from his lips more than once, has proved a very successful venture. His death took place on Thursday, the 18th instant, and resulted from congestion of the lungs.

WEST SHANDON, ON THE GARELOCH, SCOTLAND.

West Shandon, the residence of Mr. Robert Napier, the eminent engineer and ship-builder, is delightfully situate on the banks of the Gareloch, an arm of the river Clyde, about thirty miles west from Glasgow. The house contains a fine suite of rooms, embracing lofty dining and drawing rooms; the former being 34 feet by 29 feet; the latter, 30 feet by 26 feet, with library between, 40 feet by 20 feet; all communicating. Adjoining these are the large picture-gallery, 47 feet by 20 feet, and two other galleries, each 30 feet by 20 feet, all lighted from the roof. These galleries contain some rare and beautiful pictures by the ancient masters; also, an elaborate collection of old Raffaelle, majolica, and Wedgwood ware; old Venetian glass, fine Sèvres and Dresden China, Limoges enamels, and a great variety of articles of *vertu*, all carefully arranged and classified in cabinets. The style of the external architecture of the house is a modification of the Elizabethan; with large oriels and bold projecting masses, which produce an agreeable effect, in conjunction with the broken skyline given by the roof and turrets. The house, although begun in 1851, has been finished but recently.

REFERENCES TO PLAN.

A. Porch.
B. Entrance-hall, 16 feet by 14 feet.
C. Cloak-room, 15 feet 6 inches by 7 feet.
D D D D. Corridors.
E. Sculpture-gallery, 16 feet by 16 feet.
F. Drawing-room, 30 feet by 26 feet.
G. Library, 40 feet by 20 feet.
H. Dining-room, 34 feet by 29 feet.
I. Plate Safe.
J. Butler's Pantry, 14 feet 6 inches by 8 feet.
K. Butler's Room, 14 feet 6 inches by 11 feet.
L. Butler's Bedroom, 14 feet 6 inches by 10 feet 6 inches.
M. Principal Staircase.
N. Wine-cellars.
O. Kitchen, 20 feet by 19 feet 9 inches.
P. Scullery, 18 feet by 10 feet 6 inches.
Q. Servants' hall, 20 feet by 11 feet 6 inches.
R. Housekeeper's room, 18 feet by 16 feet.
S. Store-room, 10 feet 6 inches by 9 feet 6 inches.
T. Picture-gallery and billiard-room, 30 feet by 20 feet (lighted from the roof).
U U. Museums of majolica and Raffaelle ware, &c., 30 feet by 20 feet, and 18 feet 6 inches by 10 feet 6 inches (lighted from the roof).
V. Dressing-room, 19 feet 6 inches by 9 feet 6 inches.
W. Clock-tower.
X. Bed-chamber, 21 feet by 16 feet.
Y. Breakfast-parlour, 24 feet by 20 feet.
Z. Picture and organ gallery, 47 feet by 20 feet (lighted from the roof).
1. Engine for organ.
2. Kitchen passage.
3. Larders and pantries.
4. Coal-cellar, 27 feet 6 inches by 12 feet 6 inches
5. Larder, 18 feet by 8 feet.
6. Open yard.
7. Baking-house, 18 feet by 12 feet.
8 8. Carriage approach to stables, &c.



WEST SHANDON; ON THE GARELOCH, SCOTLAND.

THE MINES AND MINERS OF THE UNITED KINGDOM.*

BACK in those dark days, where the guiding light of history has not penetrated—where we are aided alone by the uncertain flickerings of wild traditions—British mining has its origin. The Tyrian navigator, in all probability, reached these shores, and traded with our forefathers for the tin which was employed in the manufacture of those bronzes which were so prized by the ancient monarchies of the East, and which now are prized as antiquities in our own museums. It is true this is doubted by one of our high authorities. But Sir George Cornewall Lewis, in his "Astronomy of the Ancients," has only opened a door which he has found himself unable to close; and he has left the subject of our commerce with the Phœnicians in a sadly disturbed and most unsatisfactory state. The evidences of mining, by that people whom we usually distinguish as the ancient Britons, it must be admitted, are obscure. I have, however, pursued the inquiry for more than twenty years, and have never lost an opportunity of examining any work, assigned by tradition to the pre-Roman period; and I feel assured of the existence of the rude works of a rude people, to which I can now point as satisfactorily indicating the labours of our British forefathers.

The Roman mines in Cardiganshire, in Shropshire, and some other counties, show us that the followers of Julius Cæsar sought with great industry to render the natural treasures of Britain available for useful ends. The inscribed pigs of lead, and ingots of copper, which have been discovered and preserved, acquaint us with this, and prove the Romans to have been not only successful miners, but skilful metallurgists. From the departure of the Romans, after their four hundred years of occupation, we have no reliable evidence of the progress of British mining for upwards of five centuries.

It is, however, certain that mining operations must have been prosecuted during this period, as we find the tinners of Cornwall and Devon of sufficient importance to obtain from King John, in the third year of his reign, a charter granting them especial, indeed tyrannical, privileges.

Presuming, it would appear, upon the patronage bestowed on them, they assumed to themselves extraordinary powers. We find a petition to Parliament, in the first year of the reign of Edward I., asking for protection from the incursions of the miner, stating, "The said tinners do daily dig and claim to dig in every species of land, as well in tilled as in other lands, and destroy houses, meadows, and woods, and divide and turn the course of water, running as well to mills as elsewhere, throughout the whole country, to the great destruction and dispersion of the said commonalty."

At a later period several of our monarchs gave every encouragement to mining operations, and Queen Elizabeth persuaded many German miners to come to this country, to whom she granted free right of search for minerals over the most important mining counties. The purpose of this Queen was to introduce a better system of exploration than that which then prevailed. From this period the progress of our mineral industries is tolerably well defined, and we may record a steady advance in the rate of production, until we find the value of our minerals, exclusive of building stones and clays, to have been, in 1861, 34,602,853*l.*

The thoughts of men, therefore, have been turned to the mineral conditions of these islands for more than 2,000 years. In that period the *art* of mining has improved; and the engineering appliances which have been brought to bear upon the ventilation and the draining of mines are fine examples of mechanical ingenuity. The *science* of mining, however, can scarcely be said to have, as yet, an existence. In 1856 Mr. John Taylor, who must be regarded as a good authority, stated, before a committee of the House of Commons, "that there were no greater facilities for ascertaining the productive character of a mine now than formerly. The difference was simply in improved machinery. Our knowledge was not greater than that of our forefathers." Whatever was said in 1856, is true in 1862, and it is a sad reflection that it is so.

When the powers of the mind have been directed to any peculiar set of natural phenomena for a prolonged period, we usually discover in hypotheses advanced, and in theories more or less supported by facts, attempts to explain the causes which have been active in producing the effects observed. There is a curious absence of this in relation to mining. Beyond some very undefined notions that fire played an important part in the formation of minerals, or that mineral veins have some analogy to the veins in the animal body, or the branches of a tree, no hypotheses have been hazarded by miners proper. A few men, educated in the schools of the Continent, and two or three professors of science in this country, have, it is true, promulgated their opinions; but, until Werner published his theory, they advanced but little beyond the creations of fancy.

The psychological influences of subterranean toil form a strange but interesting subject of study. These, and the effects of that continued uncertainty as to the reward which labours of the severest kind are to receive, are distinguishingly marked on every miner. In occult powers they are believers; and when, about a century since, the "Divining Rod" was introduced into Cornwall as a means for finding mineral lodes, it was eagerly seized upon; and, to the present day, several families are supposed to possess remarkable powers as diviners, or, as they are commonly called, "dowsers." The most elementary laws of science are still a book sealed to the large majority of miners; and while they are, of all men, themselves the most theoretical, they always meet any attempt to explain phenomena upon the evidences of inductive research, by pronouncing the explanation to be a "theory," which is of no value to a "practical."

We therefore find that the means adopted for determining the value of a mineral district, or of a metalliferous vein, are of the most uncertain character. The task is committed to men who have only their prejudices to guide them. By prejudices we must be understood to signify crude opinions, formed from mere experience—an empirical knowledge of the most imperfect kind. "Without principles, one mining agent recommends a trial to be made, which another rejects as unworthy; consequently, should there be funds at command, and a sufficient period of time allowed to elapse, no portions of the veins or lodes are left untried; and practically, the art of mining has degenerated into a mere try-all system."

The author whom we have quoted (Wallace), himself a miner, continues:—"The impossibility of arriving at any knowledge of practical value respecting ore deposits in veins is avowed by those who, with singular inconsistency, attach the greatest importance to individual experience. Even some occupying high distinction as directors or proprietors of mines affirm, without qualification, that it is impossible to see through solid rocks; or they summarily dismiss further considerations on the subject by remarking that the old adage current among miners expresses an important truth, namely,—

'It is only by cutting the ground
That the metal is found.'

The Cornish miners express their doubts by a similar phrase:—

'Where it is—there it is.'

If these are not the apologies of indolence and ignorance, they certainly are the utterances of despair."

It must be admitted that amongst the miners there is an entire absence of any method by which a knowledge may be obtained of the causes leading to the production of mineral deposits; while the speculations of those philosophers who will not endure the toil of subterranean investigations are wild, and consequently valueless.

The natural consequence of this imperfect knowledge is, that all mining operations are necessarily attended with much uncertainty. From time to time a most productive mine is discovered. The Devon Great Consols, first known as Huel Maria, has paid 826*l.* dividends upon every share; one pound only having been paid for shares now worth 490*l.* each. Upon the shares of South Caradon, near Liskeard, the trifling sum of 25s. only was ever paid: the last price of those shares was 390*l.*; and 391*l.* profit has been paid on every share. * * * * *

I have rapidly sketched the conditions which exist at the present time in relation to the mining operations in this country, in especial relation to the amount of knowledge which has been brought to bear on this important subject. I have endeavoured to direct attention to the fact that during a long period of time no advance has been made in our knowledge of the phenomena of mineral deposits; to show how purely speculative have been nearly all the explanations which have been published; in fact, to insist upon the position that empirical knowledge only has been brought to bear on a subject which materially connects itself with the prosperity of the land. I have approached the subject in the most entire independence: I am unbiassed by any interest: my desire is purely and simply to aid in the introduction of some system which shall remove mining from that realm of speculation in which it has been suffered to remain.

It is important, in the next place, ere proceeding to examine the question, Can anything be done?—to see if the value of the product is deserving that attention which is necessary to insure a more satisfactory result. By the continuous labour of some years I have succeeded in securing for this great mining country a statistical record of our mineral produce, which is not excelled by that of any country in the world. The results for the last three years are shown in the following tables:—

Quantities of Coal raised.

	1859. Tons.	1860. Tons.	1861. Tons.
England.....	53,897,115 ..	61,017,460 ..	63,870,123
Wales.....	7,662,350 ..	8,005,313 ..	8,561,021
Scotland	10,300,000 ..	10,900,500 ..	11,081,000
Ireland	120,300 ..	119,425 ..	123,070
Total for United Kingdom ..	71,979,765 ..	80,042,698 ..	83,635,214
Estimated value.....	£17,994,941 ..	20,010,674 ..	20,908,803

General Summary as to Minerals for 1861.

		Quantity.	Value.
			£.
Tin	Tons.	11,640	725,560
Copper	,,	231,487	1,427,215
Lead	,,	90,696	1,136,249
Silver Ore	,,	29	1,471
Zinc Ore.....	,,	15,770	31,113
Pyrites	,,	125,135	79,715
Arsenic	,,	1,450	10,875
Nickel.....	Cwt	16	24
Wolfram	Tons.	8	29
Antimony	,,	15	45
Manganese	,,	925	2,925
Sundries: Gossan, Ochre, &c.	,,	3,016	3,016
Iron Ore	,,	7,215,518	2,302,371
Coals (sold and used) ..	,,	83,635,214	20,908,803
Other Minerals	,,	2,222,602	880,114
Total Value of Minerals produced in 1861..			£27,509,525

Metals produced from British Minerals.

		Quantity.	Value.
			£.
Gold	Oz.	2,784	10,816
Tin	Tons	7,450	910,762
Copper	,,	15,331	1,572,480
Lead	,,	65,643	1,445,255
Silver.....	Oz.	569,530	144,161
Zinc.....	Tons.	4,415	79,101
Iron, Pig	,,	3,712,390	9,280,975
Total Value of the above			£13,443,550
Estimated Value of other Metals.....			250,500

This enormous amount of wealth is annually produced from our rocks by the exercise of human industry.* The lamentable casualties, however, which are continually recurring, prove that there is yet much to do in the way of instruction; and let me ask is it not in evidence that the great loss of life which is shown by the colliery inspector's report, amounting to about 1,000 in each year, as the following summary for ten years will show, is chiefly due to the ignorance and consequent obstinacy and recklessness of the working men:—

Summary of Lives Lost in the Coal Mines of the United Kingdom for the Ten Years ending 1860.

Years.	Lives Lost.
1851	1,062
1852	671
1853	755
1854	779
1855	723
1856	1,038
1857	1,119
1858	931
1859	904
1860	1,108
Total lives lost....	9,090

Schools for miners were established at such a distance from the mines and the miners' homes, that it was impossible for the man who had laboured eight hours in the dark recesses of the earth, and toiled for an hour on perpendicular ladders in climbing to the surface, to attend the school. The effort, it appeared to me, should be made, seeing that the miner could not go to the school, to take the school to the miner. I have worked to this end, and organized the Miners' Association of Cornwall and Devonshire. With

* Condensed from a paper read by Mr. Robert Hunt, F.R.S., at the Society of Arts.

* The total quantity of minerals carried on railways in the United Kingdom last year amounted to 63,604,434 tons.—ED.

very limited subscriptions from the mineral proprietors and from others connected with the mines, ten classes have been established in as many mining centres. In these classes are taught, by qualified teachers, chemistry, mineralogy, mechanics, surveying, and mechanical drawing. Each of these classes is well attended by working miners; and the applications made to the council of the Miners' Association to establish yet other classes in other districts are urgent; and, unfortunately, at present beyond the means at their disposal.

That we have to contend with the prejudices of the older miners is certain. In Great Britain there are—

Coal mines.....	3,000	employing	250,000 persons.
Iron mines	uncertan	,,	27,000 ,,
Copper mines	167	,,	22,000 ,,
Tin mines	148	,,	14,500 ,,
Lead mines.....	390	,,	21,500 ,,
Zinc and others....	—	,,	1,000 ,,
Making a total of			336,000 persons

actually engaged in mining operations: this is exclusive of quarries of all kinds.

Out of these 300,000 there certainly are not more than 300 under any such course of instruction as is necessary to fit them properly for the labours to which they are destined. We boast of our educational progress. We teach reading and writing in every, the remotest, corner of the land, and there we stop. We instruct our children in a knowledge of the signs by which ideas are expressed, but we leave them to gather ideas by any accidental means which may present themselves. We put tools into the hands, but we trust to chance for a knowledge of the way to use them.

A HINT FOR THE ALTERATION AND USE OF LARGE BUILDINGS IN THE NEW METROPOLITAN CATTLE MARKET.

THE question of appropriating a sum of money, amounting to between forty and fifty thousand pounds, which some years ago was voted by the corporation of London, for the erection of healthy dwellings for the industrious classes who are engaged in work in the City, and who require a home at no great distance, has been again brought under the notice of the common council; and, with considerable unanimity, that body has submitted the subject to the consideration of the proper committee.

In the old Smithfield Cattle-market, when it was in all its glory, there were several inns, some of them of considerable antiquity, which did a large amount of business, not only on market days, but at other times; for country people—farmers and others—who had business in town, were in the habit of staying there; and on all days there was much traffic through Smithfield.

On the removal of the market to Islington, the quaint old-fashioned inns of Smithfield lost a large amount of custom; but instead, huge structures, splendidly built, bearing the same signs as were so well known in the ancient market, were opened as hostelries and hotels in the new place. On market mornings some of these are busy scenes; but for the remainder of the week they are almost deserted; and other buildings, which have been reared at a large cost, have never been used as inns at all: nor is it likely that they will be; for constantly the quantity of dead meat brought from distant places by the railways is increasing, and is likely still further to increase; particularly when the Smithfield dead-meat market and the means of transit by rail from all parts to this central spot are completed.

There is also a change in the manner of transacting business between the breeders, salesmen, and buyers of cattle and sheep. There is now very little necessity for farmers and others to come constantly to town, often by slow journeys, to superintend the sale of their stock; for agencies are so well established that business can be just as well managed without their attendance. It is no longer necessary for farmers and others to ride along dangerous roads, with heavy money-bags and large rolls of bank-notes in their possession. But now the money is paid, mostly by cheques, into the banks which are in the market; and then advice of the receipt of money can be sent by post or telegraph, giving the right persons credit with the country branch and other banks for the value of their produce. Even most of those who do come to market make no long stay: they leave by an early train, or may-be travel all night, and return directly after the business of the market is ended. In consequence, some of the large houses provided are totally without use: some of these are, in a manner, distinct from the market, and have even now very little communication with it. At very little trouble and cost, they might be safely enclosed, and entrances might be made from the grounds to the north. If this were done, and certain interior alterations made, it is suggested that many families might be well accommodated, and what is now a complete loss made a matter of profit.

There is perhaps no site in the whole metropolis so healthy as this. From every side gentle slopes lead away: the drainage is perfect: the washing or cleaning of the area of the market is so perfectly done that no tint or impurity is allowed to remain, either in winter or summer. The Caledonian-road Railway Station, from Blackwall, City, &c., is close at hand; and other lines will shortly converge to the neighbourhood.

With the buildings already in existence, and the erection of others, provided the demand for them should increase, we might here have healthy lodgings provided for a large number of industrious persons who are now living in unwholesome pent-up places.

It would be well for the City authorities to look at this matter in a practical way, and consider in what manner the buildings mentioned could be converted; the cost of doing this, and the probable rate of profitable return.

THE DEPARTMENT OF PUBLIC WORKS IN INDIA.

SIR, — The letters of your correspondent "Indian" have been read with much interest in India; and I can testify that his remarks upon the mismanagement of public works apply as well to Bengal as to Madras.

"Indian" does not allude to the fact that since 1859 about ten young civil engineers have been sent out yearly, mostly to the Bengal presidency. These young men are selected by competition; and as the class who furnish the candidates are mostly readers of the *Builder*, permit me to open their eyes a little as to the real value of these appointments.

The chief points of the agreement are, an obligation to serve for ten years; not to engage in any trade or business whatever; with the penalty of dismissal and forfeiture of one year's pay for breach of covenant, drunkenness, insubordination, or other misconduct. In return, Government promise a free passage, a year's pay, at 200*l.* a year, while studying at college, with free quarters, and then transfer to the effective establishment, with the rank to which, in the opinion of Government, his attainments may entitle the probationer; the lowest grade being 300*l.* a year. He is then to be entitled to all the rights and privileges of pay, pension, promotion, and leave, appertaining to his rank.

Now for a commentary on all this. The free passage, instead of being first-class, such as officers receive, costing about 90*l.*, is a contract affair, from 40*l.* to 50*l.* Generally the vessel is not a regular passenger ship, or she carries some cargo, such as creosoted sleepers, which makes the owners glad to take passengers at any price. Of course the provisions and arrangements are most inferior.

Next, the college plan has failed, and the probationer is transferred immediately on landing to the effective grade, invariably with the lowest rank, of 300*l.* a year, which, deducting house-rent and keep of houses—not required at college—is little better than the 204*l.* After a year's service, one would suppose that the engineer was still entitled to be posted to the grade to which in the opinion of Government his attainments might entitle him; but it is not so. The Government have officially ackowledged these officers after their year's probation to be entitled to the second grade from the bottom, 420*l.* a year; but have refused to give them the step on the ground that they have no vacancies.

Well, what are the "rights and privileges" as to pay, promotion, &c.? None at all! The Government supply to candidates a table of the different grades with their salaries; but they reserve the power of diminishing these at pleasure, and have done so already. As to promotion, the regulations say that two officers of each grade are to be promoted, if deserving, in each province half-yearly. But, by recent orders, the establishment of each grade has been reduced, and no promotions can take place till the surplus number in each grade has been worked off. In some instances promotion is absolutely stopped for the next three or four years. Besides this, the numbers of the lower grade—300*l.* a year—are fixed at about three times that of the next higher—420*l.* As the number of vacancies in the 420*l.* grade, even when reduced, will never exceed about one-third of the whole, it follows that only one-ninth of the 300*l.* grade can be promoted yearly; in other words, that the *average* time passed in this grade will be nine years! Further, every Royal Engineer officer, and every military man, has to be provided for first. Imagine, then, what the chance of promotion is for a civilian without friends or interest.

Again, when by patience the grade of first-class assistant, 420*l.* a year, is reached, before the next step, special assistant or executive engineer, fourth class, with 600*l.* a year, can be obtained, the P. H. examination in Hindustani has to be passed. The candidate must read and translate books in true characters,—Persian and Devanagari, and manuscripts in Ta'lik, as well as write exercises in these characters, all in a high polite language, quite different from that spoken in every-day life. This examination requires six months' steady reading, devoting one's whole time to it; and it is reported that it will be shortly made much more severe. Considering that an assistant engineer is in the saddle, in office, or working in his own quarters from 4 a.m. to 6 or 8 p.m., how is he to find time to prepare for it? The fact is, it is an ingenious device for stopping the promotion of civilians. Military men must pass it before entering the department, so it does not hurt them.

After pay and promotion, comes leave. Theoretically, each officer has one month's leave each year on full-pay; but, as this is not granted if any detriment would be caused to the public service; and as assistant engineers would cause great inconvenience by leaving their work without a substitute, which Government refuse to provide; practically, an assistant engineer scarcely ever gets leave at all. And in six years, you may take six months' leave on private affairs, on one-third pay,—if you have saved enough out of your very small pay, first, to pay your whole expenses for six months, for you get no pay till your return; and, secondly, to give security for the whole of the accounts unadjusted with you, varying from 2,000*l.* to 10,000*l.* The last rule has only just come out; and, if interpreted in its literal meaning, will stop leave altogether.

Sick leave I need say little about, except that you get half-pay for six months; one-third for eighteen months; and, if you choose to go and get sick any more, from overwork and exposure, within three years of your last sick-leave, why you must quit the service, an invalid for life, without *a penny of pension*, or any compensation whatever.

Lastly, as to pension. No pension is a matter of right: you are entirely at the mercy of the head of the Department, who can recommend Government to give or withhold it at pleasure. No pension whatever is given before twenty-five years' service.

N.B. I believe not a single officer has served in the Department, as an officer, for twenty-five years. No one can stand the hard work and exposure for such a long period.

No pension is given, even after twenty-five years' service, unless the applicant is disqualified for further service by blindness (which is very common in the Department to a partial extent), or confirmed ill-health.

No pension is given unless the applicant is quite unfitted for further work, until *thirty-five* years' service, and then only as a favour.

No pension is to exceed one-third of the average pay for the last five years' service; and in no case to exceed 400*l.* a year.

Any one who takes the trouble to compare these rules with those of the Civil Service clerks at home, will find that the latter, with a good climate, no responsibility, purely mechanical work, and very little of that, are very much better provided for than we, who, in ten or fifteen years, wear out our lives with incessant and absorbing work, fatigue, and anxiety, under the terrible sun of India.

Young men are apt to be deceived by the apparently high pay: 300*l.* a year sounds a good deal; but it is absolutely impossible for a young man in a military station in India to save a farthing out of this, let him be as frugal as he may. 100*l.* a year in London is fully equal to 300*l.* a year in India. Any one who has tried both, as I have, would much prefer the former.

The Government out here entirely ignore the covenant, and are perfectly indifferent to the written promises of a Secretary of State. They say in effect, if not in words, "What do we care for what the India Office told you? You have come out here, and can't get back. You must take things as you find them." The only thing

for us is, no doubt, to grin and bear it; but, with the hope of saving others from the same cruel disappointment, I have written this true and faithful account of the Department which Sir Charles Wood, and the officials at the India Office, paint in such glowing colours.

I must add one thing, to give the devil his due. Whatever jealousy is felt against us in official quarters; in private life we have been received and treated as gentlemen both by the members of our own Department and general society. Indeed, the Department of Public Works is looked upon as rather aristocratic than otherwise; swarming as it does with the Bengal Engineers, who are the crack corps in the country.

But this is a very small piece of bread to that intolerable quantity of sack (cloth?).

A VICTIM.

THE ARCHITECTURAL ASSOCIATION.

PROPOSED ARCHITECTURAL ALLIANCE.

A SPECIAL meeting of the members of the Architectural Association was held on Friday evening (the 19th inst.), to reconsider the propriety of joining the "Architectural Alliance;" Mr. Blashill, president, in the chair.

The requisition calling the meeting having been read, and also the report of the delegates from the Association who had attended the meeting of the "Architectural Alliance,"

The President explained the course which the delegates had taken at the meeting in question; observing that he had been asked, as the representative of the only metropolitan society present, to take the chair on that occasion, but that he had declined to do so, on the ground that in his opinion the responsibility of inaugurating the proceedings devolved upon those who had convened the meeting. The rules agreed upon by the delegates had subsequently been discussed *seriatim* in the committee of the Association: the general meeting of the 14th of November had approved of the proposal to join the "Alliance;" and the meeting had now to reconsider the propriety of the resolution already passed.

Mr. E. L. Paraire observed that as he had addressed a circular to the members on the inadvisability of joining the "Architectural Alliance," it might perhaps be desirable that he should state the objections which he entertained to the proposal for joining that Alliance at present. A meeting of delegates was held on the 6th of June last, and four gentlemen were appointed to represent the Association at the conference. Their instructions were that they were neither to grant nor to refuse the adherence of the Association to the Alliance, but that they were to listen, to hear any explanations, and to take any part in the discussion that might seem to them to be desirable. The four gentlemen attended accordingly, and they reported that they had listened, had heard explanations, had taken part in the discussion, and that they recommended the Association to give in its adherence to the Alliance. The fourth rule of the Alliance set out that it was to take cognizance of all matters affecting the interests of the profession; while the eighteenth rule declared that the Alliance could not rescind any of its rules, such power being reserved to a majority of two-thirds of the members of the Alliance at an annual meeting. Now, looking at the fact that the Architectural Association consisted of two hundred members, while all the other societies in alliance numbered together very few in excess of that figure, he had come to the conclusion that the Association would not be adequately represented by four delegates sent to the Alliance. Suppose, for instance, a proposal was made in the Alliance that the commission to be charged by architects should be 2½ per cent., how could it be said that the four members sent by the Architectural Association would be a fair quota when the other societies, the whole of whose members did not exceed 200, would have seventeen delegates present. The four societies which had already joined the Alliance were the Northern Architectural Association, the Bristol Association, the Manchester Association, and the Glasgow Association. They appeared to consist of ninety professional men connected with architecture, thirty-nine students, and eighty-four honorary members of various trades and professions; but should the Institute of Scotland and the Liverpool and Birmingham Associations join, the members in the several societies would be,—architects, 132; students, 79; and honorary members, 178; making a total of 389 only. He confessed that in his opinion it was difficult to ascertain the object or purpose of the Alliance. It appeared to take up the undefined position of adjudicating on all matters connected with the profession, but it seemed to be unable to define the character of its operations. When interrogated upon this point by some members of the council of the Institute, all it did was to hold up a sheet of printed paper, and say, "These are our rules." The Architectural Association was essentially a body of students and architects; and how, he asked, could they with any propriety join a body in which the honorary members out-numbered the professional, and who would have the privilege of discussing and deciding upon all matters affecting the interests of the profession. The Association had, however, decided, by a majority of *one*, that it would join the Alliance. It had also passed a unanimous resolution to assist the Royal Institute of Architects in ridding the profession of non-professional men. The ambiguous position in which the Association thus placed itself, had induced him to invite the members to reconsider their recent resolution. If the Association really desired to join the Alliance, let it be on a sufficient majority to warrant such a step; but, on the other hand, if the members really meant to support the Institute in raising the *status* of the profession, let them not join in a movement antagonistic to the vote of confidence in the Institute to which they had agreed on the 30th of last month. In conclusion, he moved, "That the resolution of the 14th of November, viz.—that the Architectural Association should join the Alliance—be rescinded."

Mr. Wimbridge seconded the motion.

Mr. Roger Smith (one of the delegates who had attended the conference of the Alliance) proposed as an amendment "that the resolution of the 14th of November, that the Association do join the Alliance, has the cordial approval of the meeting." He referred at some length to the various arguments brought forward by Mr. Paraire; and contended that the motion submitted by that gentleman was tantamount to a vote of want of confidence in the delegates. The gentlemen who had signed the requisition were, he thought, ungrateful. He held that it was a good thing to join the Alliance, because it would tend to promote harmony and good feeling among the various architectural associations throughout the kingdom; that it would lead to an interchange of ideas; to the circulation of such provincial papers as necessarily could not find their way into the professional journals; that it would enable architects and students to obtain local information with regard to the price of materials, labour, &c.; and that it would act as a common bond of brotherhood between metropolitan and country architects. He denied that non-professional persons would be able to sit in judgment upon purely professional matters, as they were excluded altogether from voting under such circumstances. As for the adjudicating power of the Alliance, it could, in fact, adjudicate upon nothing but its own rules. It was true that the Institute had not joined it; but he believed that if the Association were to take the initiative, the Institute would, in course of time, follow their example, as it had already done in the matter of architectural examinations.

Mr. Arthur Allom, in seconding the amendment, supported the view taken by Mr. Smith, and contended that the Alliance would be the means of assisting the architectural body in gaining the respect of the public. The contradiction which had been given to the assertion that non-professional members would be able to vote on professional matters had, in his opinion, removed the gist of the objections taken by Mr. Paraire to joining the Alliance.

Mr. G. B. New thought that Mr. Paraire was entitled to the thanks of the Association for ventilating the question; and added, that although he was favourable to re-opening the question, he could not, after the explanation given, vote for the motion.

Mr. Herring, Mr. Rickman, Mr. Capes, and Mr. Penfold supported the amendment, as did Mr. Mathews, who remarked that if the Alliance had not some metropolitan support, the probability was that it would "break up altogether."

After some further discussion,

Mr. Paraire replied, and handed in a number of proxies, which had been forwarded to him from persons desirous of rescinding the resolution to join the Alliance.

The President, however, decided that he could not receive them, as they had not been deposited with the honorary secretaries, in accordance with the rules of the Association.

The amendment of Mr. Roger Smith was then put; and, upon a show of hands, it was declared to be carried by thirty-one to seven.

A vote of thanks was subsequently passed to Mr. Smith, and the other delegates who had attended the conference of the Alliance.

The meeting of the Association announced in the programme for the 26th inst. will not be held.

ON ARCHITECTURAL COMPETITIONS.

GLASGOW ARCHITECTURAL SOCIETY.

AT a meeting of this society, held on the 15th inst.; Mr. Alexander Thomson in the chair; Mr. James Boucher read a paper on Architectural Competitions, in the course of which he gave an account of the course often taken by committees, and urged that they should at once appoint an architect, instead of inviting competition as a mere blind. In conclusion, he said,—I would submit a list of questions for the consideration of the members of a building committee:—Have I, in sanctioning this competition, been actuated solely by the desire of obtaining the best design? Do I consider the instructions given to competitors as binding on myself, and is it my intention to abide faithfully by them? Have I taken the advice of other committees who have passed through this ordeal, and do they recommend this as a right and proper step? Have I allowed myself to be influenced by any of the competitors? Will the congregation think it fair and honest to select the design which strikes my fancy, and not take steps to secure the best? Does my conscience tell me that it is right to accept of a design costing 4,000*l.*, when I have stipulated for one at 3,000*l.*? Have I ever thought that the ideas contained in unaccepted designs are no more my property than the goods in my neighbour's shop? Would my character for fair dealing be injured if I were to conduct my business as I conducted my competitions?—Should any of the architects now hearing me still resolve to abide by the present system, and run all risks rather than lose the opportunity of securing an occasional building, we have, for their special benefit, culled the following article from a very old work, now out of print, entitled, "Advice to ye students in ye profession o ye ancient craft o building an architecture, whereby ye may betimes become truthful in ye representation o ye great works o ye glorious ancient cities o Athens an o Rome, an may (wi ye guid hand o ye committee o taste) build up works o modern tymes which never was hereto seen before." "*Imprimis*—Mak ye elevation, an ye view in ye perspective well colored in ye most brilliant colors, ye sky wi ye flitting cluds, and ye fourground studdied wi ye regimentes o gay an valient soldiers; nor be unmindfu of ye guid kinges carrige, wi his prancin horses an runnin footmen, all o which do give life an great gaiety to ye scene, an cause great attraction to ye gentlemen o ye committee. *Secondo*—Ye elevation thus complete, trust to ye success wi ye committee, for though be it they advertize for ye plans, ye sections, ye estimates, they are of a verity more taken wi ye regimentes o gay and valient soldiers than ye plain lines, which do show ye great science and ye accommodation within ye building. *Terzzo*—Oblige ye committee wi ye estimate on ye lowest terms, an when ye walls rise, and ye genius is thereby made apparent, slight mention may be signified o hasty estimates, difficulties unforeseen, an exceeding great delays, which ye committee will duly consider, and maybe tack on two an a half per cent. extra, if not screw it fra ye builder."

After the reading of the paper, some general conversation ensued, in the course of which Mr. Campbell Douglas expressed his general concurrence with the views of the writer.

Mr. Gildard thought the architects ought to impose conditions when submitting plans, and say that they would compete only on those conditions. If these conditions were not approved of, then they should not compete.

Mr. Honeyman agreed with Mr. Boucher, except in one or two minor particulars. He thought some blame attached to the architects themselves; for in many cases, whether plans were asked or not, the committee were inundated with applications to compete, and solicitations to examine designs free of charge. Architects should not be astonished if the result of this undignified and degrading practice should be that committees valued the labours of competitors lightly when they themselves seemed to value them at nothing. Then, another thing for which committees had been blamed in unmeasured terms was, that as a rule they chose the most expensive plan submitted, however much it violated their conditions in regard to cost; but in this case also the certain remedy lay in the hands of the architects themselves, since nothing could be more unquestionable than that

if competitors did not submit designs which would cost more than the prescribed sum, committees would not have it in their power, however "unscrupulous," to act unfairly in this particular at least. He had not the slightest expectation that architects would ever agree to try this radical remedy, because they would—they could—never have sufficient confidence in each other. For the same reason he was now satisfied that the scheme he had on a former occasion proposed to them was quite impracticable. At that time he thought that the profession might agree to some rules which would in a manner compel its less conscientious members to respect the conditions of competitions. He now agreed with those whose opinions he valued, who pronounced that scheme Utopian. Indeed, they would believe in the completeness of his conversion when he said that he was now of opinion that architects had so little confidence in each other, and indeed such good cause for mutual distrust, that it was absurd to expect that they should ever carry out a combined effort to relieve themselves from the evils of which they so loudly complain.

Mr. Watt suggested that, if architects would agree to demand, as a necessary condition in all competitions, that the whole of the designs should be publicly exhibited after the selection had been made, they might be able to check a great number of the evils now existing. He deprecated the idea that architects deceived the public; and threw a great measure of the blame on committees.

Mr. Howatt thought that the course proposed by Mr. Watt might be of great practical benefit. He thought the essayist went too far when he asserted that competitions had hitherto failed to educe genuine merit or to advance architecture as an art; and mentioned the case of St. George's Hall and other instances to prove the contrary.

The chairman thought that competitions for churches and other works of that class were altogether inexpedient and ought to be discouraged, because the capabilities of the local architects were quite well known. He was of opinion that their only chance of reforming present abuses was to stand faithfully by each other, to unite on some broad principle, and to take up the position before the public of a consolidated body which must be dealt with, in its collective capacity, in all cases, as the second party to any arrangement regarding a competition.

WORKMEN'S CLUB-UNION.

Mechanics' Institutes failed to effect the objects in view; but the class above mechanics felt them so suitable to *their* wants that such institutes became successful in a sphere they were not at first intended for; and their general name of Mechanics' Institutes therefore was to a great extent a misnomer. Still, these institutes have done and are doing much good. It has become clearly advisable, however, to institute a new and special order of associations for behoof of *bonâ fide* working men, in which the experience acquired in the establishment of "Mechanics' Institutions" shall be made use of both negatively and positively, for the advantage of workmen. The "Working Men's Club and Institute Union, for promoting the social, mental, and moral improvement and recreation of the working classes," has been founded, under influential auspices, for the establishment and aid of such new institutions throughout the country. Lord Brougham, who was so mainly connected with the establishment of Mechanics' Institutions, is the president; and among the vice-presidents are many other influential names, beginning with Earls Spencer and Fortescue, and Lords Lyttleton and Calthorpe. The council, we are glad to observe, includes a sprinkling of intelligent ladies. The Rev. H. Solly is the secretary; and the offices are at 150, Strand.

The prospectus states that—

"This union is formed for the purpose of helping working men to establish clubs or institutes where they can meet for conversation, business, and mental improvement, with the means of recreation and refreshment, free from intoxicating drinks; these clubs, at the same time, constituting societies for mutual helpfulness in various ways.

It will be the aim of the council of the union to assist in extending or improving existing associations, which have in view objects of a kindred nature with the above, as well as to promote the establishment of clubs, or institutes, where no such associations may now be found. In order to consolidate and strengthen the action of these various associations, clubs, or institues, the council will invite them to become members of the union."

In their general remarks the promoters say:—

"The aim of the union in all cases would be to help working men to help themselves, rather than to establish and manage institutions for them.

The club-rooms in every locality will form the strongest counteraction to the allurements of the public-house. The desire for social enjoyment, and the love of excitement, are the impulses that habitually drive the working classes to visit the beer-shop. Music, also, which ought to purify and refine, is now extensively employed as a temptation to drinking and other vices. Until there shall be established in every locality an institution that shall meet these instincts, with superior attractions, but without temptations to evil, it is unreasonable to expect a great diminution in the drinking customs of the working population. This want the proposed clubs will supply.

Gradually the proposed clubs and institutes will become the houses of call for men in search of work, and will be the centres of various working men's societies, such as friendly societies, freehold and building associations, co-operative societies, circulating libraries for the district, temperance societies, and of any similar agencies calculated to improve the condition of the working classes.

These are no mere visionary ideas. They have been already reduced to practice, with most beneficial results, in Westminster, Notting Hill, Paddington, Norwood, East London, Shrewsbury, Leeds, Faversham, Lancaster, Carlisle, Southampton, and various other places. The Working Men's Club and Institute Union aims at multiplying such results by stimulating and assisting local effort."

A correspondent of the *Star*, speaking of the Southampton clubs (for there are now three of them there) says:—

"The first was opened in June last; and, in spite of long summer evenings and the distrust which at first existed, we had upwards of 700 men, engaged in sixty-eight different trades, join us before we had been established two months. To enable them to judge for themselves the first hall was opened free; but before a month had elapsed the working men themselves convened a meeting, at which upwards of 200 attended, and they decided by a unanimous vote to support it by a penny per week subscription. It is a very gratifying sight to see 100 to 150 labouring men (the great mass of whom are entirely beyond the reach of Mechanics' Institutes or Athenæums) assembled together in their working clothes, and with as much order and decorum as in a West-end club, engaged in reading, or in the various games provided for their pleasure.

Believing that labouring men and mechanics require relaxation as much, or more, than the classes above them, various games, such as bagatelle, dominoes, draughts, travelling maps, fox and geese, spillicans, puzzles, &c. (in fact, the games that we admit in our families), are freely encouraged. The by-laws against betting, gambling, and improper words are strictly adhered to; and the self-restraint and wholesome discipline exercised in this way alone is very important. They all seem contented, and learn to enjoy life without the stimulus of betting, drinking, or swearing.

The main secret of our success is that *we let them alone*."

The movement is an excellent one, and shall have our best wishes and efforts for its wide-spread and successful extension.

DEATH FROM FOUL AIR.

An inquest has been held at Easthampstead, touching the death of a labourer in the employ of the Marquis of Downshire. The deceased was a very healthy man, and went for the last time to bed in good health: three other men slept in the same room, which was only 10 feet 10 inches long, by 8 feet 10 inches wide, and 6 feet 7 inches in the highest part, without any fireplace, and only a little ventilation from a broken square of glass or two in the small casement window, and from the door, which was generally left open a little way. In the morning deceased was found lying on his stomach; his face directly downwards; his arms so folded as to encircle the face; the soft part of the nose bent or twisted sufficiently to close one nostril and to lessen the other; and the position was such as would allow a very limited supply of air. None of the other three men had heard the deceased make any noise or complaint during the night. Mr. Barford, of Wokingham, surgeon, deposed as to the position in which the deceased was lying, and that he believed death had arisen from suffocation, from the unwholesome air in the room, and the position in which deceased had slept. He was struck, when he went to see the body, with the very confined apartment, which was scarcely wholesome space for one person to sleep in. Verdict, "Accidentally Suffocated."

The *Reading Mercury*, in reporting this case, makes the following remarks:—

"Will such a case as the above not open the eyes of agriculturists and landlords to the great necessity of providing a better class of cottages for their labourers? Will not the details of this accident stir them up to a higher sense of their duty in this matter? Will they continue, after reading them, as Mr. Tucker has said, to house their pigs, and give better ventilation to their beasts than is afforded to their labourers, out of whose bone and sinew and mental capacities they so largely profit? We hope not. Some noble and philanthropic men have already commenced remedying this sad state of things; and we trust they will be followed by others until a full measure of improvement is effected. Such an occurrence as the above also suggests the desirability of a close inspection of those cottages where lodgers are kept, and better sanitary regulations should be enforced than are detailed in this case."

ALBERT MEMORIALS.

The Manchester Memorial.—The Manchester committee have decided upon the site at the corner of Piccadilly and Portland-street, as the most suitable for the erection of the memorial. This site was recommended by Dr. Fairbairn, and it is understood to have the approval of the donor of the statue.

The Knaresborough Memorial.—The memorial window in Trinity Church, Knaresborough, has been fixed. It is from the establishment of Messrs. Hardman & Co., of Birmingham; and the subjects are represented in the five principal lights; viz., —The Nativity, The Transfiguration, The Crucifixion, The Resurrection, and The Ascension. The bottom middle light has the shield and arms of his Royal Highness. In the tracery of the window are emblems and monograms of the Holy Trinity. The cost of this memorial is 270*l.* The tower, we may here note, of this church, which has remained unfinished for nearly six years, is ready for the spire.

A Prince Consort Oak.—The Rev. N. B. Yonge, the curate of Overthorpe and Warkworth, near Banbury, has caused an oak to be planted at Overthorpe, in memory of the Prince.

A Suggestion from Glasgow.—Messrs. A. & G. Thompson propose the erection of "a building on the model of the Temple of Theseus, Athens, which should contain a statue of the Prince." The proposal of a statue screened by a "temple," as it is called, as a memorial of the Prince, is not new, as our readers very well know.

COMPETITIONS.

Manchester.—The ecclesiastical district of St. Michael, Manchester, is about to be provided with a new church, at the sole cost of a gentleman whose manufactory is situate in the neighbourhood. He invited four architects resident in Manchester to submit designs, and furnished the competitors with full instructions of the requirements. The choice fell upon the design of Mr. J. Medland Taylor, and the church is to be built forthwith, under his superintendence.

Leicester.—With reference to the hope we expressed as to the competition for Messrs. Hodges & Sons, Mr. Drake writes,—"Every competitor (not successful) received 10*l.* when his drawings were sent back; an example worthy to be followed wherever limited competitions are desired."

RE-OPENING OF LEEDS PHILOSOPHICAL HALL.

After an enlargement and renovation, which have occupied several months, the Hall of the Leeds Philosophical and Literary Society has been re-opened with an inaugural address by Professor Owen in the new lecture theatre of the institution. The entrance to the hall is in Park-row, by a glazed porch of Ionic columns. The entrance saloon is 43 feet 6 inches by 31 feet 6 inches, and 18 feet high. This was the old lecture theatre. The principal staircase is 48 feet 6 inches by 19 feet 4 inches, with the steps and landings 6 feet 6 inches wide. The lecture theatre is 55 feet 8 inches by 44 feet 8 inches, and will accommodate upwards of 400. The seats are 14 inches wide, and 3 feet wide from back to back, with ornamental cast-iron standards at the ends, and oak elbows. The ceiling is panelled, and the cornice perforated for ventilation, communicating with ventilating flues built in the walls and continued into the roof. On the right of the lecture theatre, next Bond-street, is the library or council-room, 44 feet 8 inches by 21 feet, and 18 feet high. On the first floor access is obtained to the old museum, 43 feet 6 inches by 31 feet 6 inches, the old geological room 50 feet 6 inches by 15 feet 8 inches, and the new geological room 15 feet 6 inches by 15 feet 8 inches. These two last rooms lead into the new museum, 77 feet 6 inches by 44 feet 8 inches, and which extends over both the lecture theatre and library. Staircases communicate with the galleries in the museums, and also with the curator's work-room, 50 feet 6 inches by 15 feet. This is a mezzanine floor. The building is warmed throughout by hot water pipes, arranged by Messrs. Haden & Sons, of Trowbridge; the gas-fittings by Mr. Hall; and all the oak book-cases and oak museum fittings by Mr. J. Hall Thorp, of Leeds. The work has been executed by the following contractors:—Wm. Nicholson & Son, masonry and brickwork; John Hall Thorp, carpenters' and joiners' work; S. Powell, plumber and glazier's work; J. Wilson & Son, plasterers' work; Croft, slaters'

work; F. Jackson, painters' work; J. Nelson & Son, ironfounders' work; clerk of works, Mr. Dilworth. Messrs. Dobson & Chorley, of Leeds, were the architects who designed and superintended the alterations.

TRANSMUTATION OF "SPECIES" IN THE VEGETABLE WORLD.

OATS INTO RYE, BARLEY, AND WHEAT.

IT has been repeatedly asserted that oats have been converted into rye, barley, and even wheat; but the "fact" has been always scoffed out of countenance, because it was inconsistent with preconceived theories. Now, however, there would appear to be no doubt about it. The *Mark-lane Express* vouches for the respectability of a gentleman who states that he carefully planted some picked oat grains in his garden in June; and as the tillers sprang up to about a foot in height, he cut them down to within an inch of the root. This process was three times repeated that year, and some of the roots died; but others survived; and next year they yielded—not oats, but perfect barley, rather thin, but by no means of a bad type. This barley, in the following spring, yielded a good return of better barley, approved by the maltsters; and of the produce of subsequent years the editor says he has seen a sample. It is remarkable that the grower did not look for barley, but rye, which he had been told had thus been obtained. The editor of the *Mark-lane Express*, on further considering the subject, is of opinion that oats are a "spurt" or sport from other grain—not *vice versâ*; as wheat and barley have been known for 4,000 years, but not oats.

In 1632, as we learn from Old Gerard's "Herbal," a "very good friend, Master John Goodyer," obtained several perfect oat grains from an ear of wheat. It is said that the transmutation of oats into barley is by means infrequent in Norway and Sweden, which, by the way, geologists have found to be a notable centre of plant distribution.

A letter from Mr. William Cowper, of Wappenham, near Towcester, appears in the *Berkshire Chronicle*, stating that he has for ten years grown both wheat and barley from Dutch oats. Black oats, he adds, will produce rye in the same way.

If any one imagines, however, that when such facts can no longer be denied, we will be any nearer to an admission that one species of plant can be transmuted into another species, he will probably be mistaken; for, when the fact can be no longer resisted, it will only be seized hold of as proof positive that oats, rye, barley, and wheat, are *not* distinct species at all; so that the transmutation of species will be as far off as ever, and thus may well be deemed impossible. Such is the childish way in which what is called science "advances." The editor of the *Mark-lane Express* thinks naturalists ought to look into the matter; and adds that "it is quite possible other principles might be elicited on the subject of the relationship existing between plants of the same family that the learned, with all their philosophy, have never dreamt of."

METROPOLITAN BOARD OF WORKS.

AT the usual meeting of this Board on the 19th, a report was brought up from the Main Drainage Committee, recommending (among other things) that—

"The tender of Mr. Webster, for the execution of the works for the Southern Low-level Sewer, for the sum of 234,000*l.*, be accepted; and that in the event of any contractor tendering for a work, and subsequently withdrawing such tender, or not furnishing approved sureties for carrying out the work, no future tender from him be accepted by the Board."

The report was, after some discussion, referred back to the committee.

INSURANCE OF WORKMEN'S TOOLS.

THE great importance of the above induces me to explain how the matter is arranged by me. I pay the premium upon what I consider to be the full value of the tools, and look to the shop-foreman to repay me. As the workmen leave the pay-table, they each subscribe one penny to the fund (and most cheerfully it is done), and at the year's end they audit the accounts, and dispose of the balance in their own way. I hope this may induce others to do the same, as the sad events continually occurring (from want of so simple a remedy), ought to impress all with its necessity.

A CITY BUILDER.

AMENDMENT OF BUILDING ACT.

SIR,—An amendment is very much required whereby the responsibility of evasions of the Act and other irregularities should be affixed to the *real* culprits—the builders. The district surveyor can only exercise a *limited* supervision: he is not like the builder, or his foreman, constantly on the spot; nor is he Argus-eyed. Irregularities may be committed for which he cannot be responsible: work is covered up, or coloured over, and bond timber fixed perhaps too near flues.

The fact of the building being completed without these matters being seen should not relieve the builder of any part of his responsibility,—certainly not the fact of the surveyor not having detected what he could not see.

A SURVEYOR

Books Received.

Flowers and Fruit Decoration. By T. C. MARCH. London: Harrison, Pall-Mall.

MR. March, it will be remembered, received the prize offered by Sir C. W. Dilke for the best table decoration submitted to the Horticultural Society in 1861, and Messrs. Dobson & Pearce having prepared his epergne for commerce, an immense sale has been the result. Report says the money returns might be stated in thousands; but for this we cannot vouch. The principal subject of the tasty little volume now published is to teach those who have bought his epergne, as well as others, the arrangement of flowers and fruit in wide and shallow vessels, with the employment of moist clay and sand as a foundation. These latter materials considerably extend the field of table decoration, and he dwells long on their value. Diagrams are given to illustrate the contrast of colours (not all happy), and some remarks are added on *London* gardening.

VARIORUM.

THE set of stories constituting the Christmas number of *Saturday Night* (conducted by Mr. Thomas Hood) purport to be the adventures of a set of Umbrellas belonging to the guests at a country-house. The stories have the merit of being very amusing. The number came to us in an envelope, on which the sender had placed two penny stamps, and this not *quite* covering the weight we had to pay 4d. more. We mention the circumstance that we may protest against the present system at the Post-office whereby such a shameful penalty is extorted from the recipient for an accident on the part of the sender.——"Colman's Magazine" is a new penny weekly,—the price of the last named. The Christmas number (a double one) under the title "Who's coming on Christmas Day?" consists of the replies of some who were asked to spend Christmas with the Okeovers. It is a marvel of cheapness, estimated by quantity; but must be improved in other respects if it is to succeed.——Messrs. De la Rue have added to their issue of almanacs an elegant little calendar on a card, for the boudoir or drawing-room, with a border of flowers in colour and gold.——The Council of the *Art Union of London* are distributing their handy little waistcoat-pocket almanac. This, in addition to the usual matter, contains much useful information on subjects connected with the arts. Every subscriber is entitled to a copy.——"The Garden Oracle and Economic Year Book for 1863," edited by Mr. Shirley Hibberd, is published by Groombridge & Co. It is full of information concisely conveyed; not mere repetition of the old story, but fresh matter, bringing the reader abreast of the time.

Miscellanea.

ORGAN FOR MONTE VIDEO.—Messrs. Bryceson have built an organ for the English Church, Monte Video, South America. A satisfactory performance took place on it last Friday evening, at their factory, in Brook-street.

DRAINAGE AT BURY.—The Earl of Derby, through his agent, has offered to open up and sewer several new streets, in Bury, Lancashire, at his own cost, in order to find employment for the labourers out of work—the money to be repaid, without interest, when the streets are built upon.

IRON MASTS.—The following are the dimensions and weight of the masts sent to Pembroke from the Chepstow Ironworks, for the use of her Majesty's ship *Prince Consort*. The mainmast is 116 feet long by 37 inches in circumstance, and weighs 18 tons 14 cwt.: the foremast is 110 feet long by 36 inches in circumference, and weighs 17 tons 10 cwt.: the mizenmast is 83 feet long by 24 inches in circumference, and weighs 5 tons 14 cwt.: the bowsprit is 43 feet long by 36 inches in circumference, and weighs 4 tons 10 cwt.

TELEGRAPHIC.—It has been found impossible to lift the Algerian telegraph cable, which has been broken near the coast of France; and although an attempt will be made near the coast of Algeria, the great depth of the water there will, it is feared, cause that attempt also to fail, in which case the cable will be considered quite lost.

GAS.—The Bath Gas Company have determined upon making a reduction of 4d. per 1,000 cubic feet. The price will therefore be 4s. 2d.——The inhabitants of Burnham have for some time been considering the propriety of erecting gas works, and the result is that "The Burnham Gas Company, Limited," has just been established. The works are to be designed by, and carried out under the direction of, Mr. Jabez Church, civil engineer, Chelmsford, who is proceeding with the same.

IMPORTANT ENGINEERING WORK.—The Dutch Chambers have ratified the concession for cutting a ship canal through North Holland, by which a direct communication will be made between Amsterdam and the North Sea. This undertaking, when completed, will, according to the description given, be one of the most important engineering works ever executed in Europe. The canal will be 13 miles long, navigable by ships drawing 24 feet of water, and will shorten the distance from Amsterdam to London, and all ports south of the Texel, by about 80 miles, and enable vessels to get to sea within a few hours; whereas they now generally spend three days, and often a week, in that process. To form a safe entrance it will be necessary to construct enormous sluices and an artificial harbour upon the unprotected coast of Holland, the piers of which will have to extend more than a mile into the sea. This will be the most difficult engineering work to be overcome.

REVIVAL OF AN OLD INVENTION IN BALLOONING.—The new Montgolfier balloon, invented by Mr. Goddard, the æronaut, says *Galignani*, has a capacity of 4,200 mètres. The car is provided with an apparatus which enables the æronaut to ascend without either gas or ballast, and to descend or go up high at pleasure. This apparatus consists of a kind of stove formed by three cylinders, separated from each other by insulating substances, whereby all danger of fire is averted. The flame is completely under the control of the aërial traveller, and is prevented from rising too high by a cup of wire gauze. Mr. Goddard asserts that he can inflate his balloon in thirty-nine minutes, and load it with from 500 to 800 kilogrammes over and above the weight of his person and his accessories, and moreover, that his balloon may be pierced with a bombshell without endangering the aëronaut, who can himself cast projectiles of any kind with impunity.

THE "EXHIBITION" AND FRENCH MANUFACTURES.—The Paris correspondent of the *Times* says:—"The Pairs manufacturers of bronze ornaments have returned from the London Exhibition with orders so numerous that, after having engaged all the unemployed artists and mechanics, they have found it necessary to prolong the ordinary period of work by three hours a day. The increased demand for gold and silver gilt ornaments, fine porcelain, and printed stuffs for export to Belgium, Holland, Spain, Italy, Portugal, and South America has given much impulse to all these trades. The International Exhibition has conferred immense benefit not only on the manufacturers of bronze articles, but likewise on French gunmakers, who at present export arms to the amount of 10,000,000f. annually. The Parisian shoemakers say that the English beat them in the manufacture of men's boots and shoes. It would be vain for them to deny the fact; for there are several shops in Paris established for the sale of men's boots and shoes of English manufacture. The Parisians, on the other hand, boast that none can compete with them in the manufacture of ladies' boots and shoes. They add that they export an enormous quantity to England and her colonies, to Russia, and to the far East. They export a second quality to the French West Indies, Brazil, and Chili. The 25,000 cabinetmakers in the Faubourg St. Antoine pretend that no country can compete with them in the form and delicacy of the articles manufactured by them, the suitableness of each part for the purpose for which it is intended, the excellence of the sculpture, the care with which they avoid every useless ornament, of great expense but of doubtful taste, with which the produce of other countries is overloaded. They assert, moreover, that the English artists have for some time past engaged many of their best hands; and that at this moment such tools as are used in Paris are made here to be exported to London."

Hotel, Ryde.—A company is being formed to erect a large hotel in Ryde, to be called The Queen's. Mr. E. N. Clifton and Mr. Thos. Hellyer are the architect and surveyor.

The Brighton Hotel.—A printer's omission in our remark last week that "the architectural character of the new hotel is Italian, *not* overloaded with enrichment," gave the reverse effect. The shareholders may feel pretty sure that Mr. Whichcord will not lead them into any unwise expenditure.

The late Mr. Solomon.—We hear with extreme regret of the death of Mr. A. Solomon, the painter of "Waiting for the Verdict," "Lost and Found," and many other pictures of great excellence, at the early age of thirty-eight. This event, which many will deplore with us, took place on Saturday last, in the south of France, where Mr. Solomon was sojourning for his health. Fortunately Mrs. Solomon was with him.

New Protestant Church, Naples.—Last week, the first stone of the English Protestant Church was laid in Naples, on a plot of land presented by Garibaldi two or three years ago. The architect is Mr. Smith, under whose directions the Protestant Church at Nice was also built. From 4,000*l.* to 5,000*l.* are spoken of as the probable cost of the edifice at Naples.

Accidents.—A pile of building, adjoining the flour-mill at Sedgley, said to be the oldest in the district, suddenly fell on Wednesday in last week. The ruins extended across the High-street and Bilston-street, rendering the roads impassable. The building was filled with grain and other materials.——A young woman has been killed by the fall of a wall in a house in Porter-street, Butler-street, Oldham-road, Manchester; and as it appeared that the house-agent had been warned about the dangerous state of the wall, and had not done anything to remove the danger, a coroner's jury have returned a verdict of "manslaughter" against him, and he has been committed for trial.

Sales of House-Property.—At the Mart: By Messrs. Tebb, Brothers.—Leasehold three houses, Nos. 6 to 8, Red Lion-street, Kingsland-road, term 63 years from 1815, ground-rent 8*l.* 4s. per annum, let at 35*l.* 2s. per annum—sold for 100*l.* Leasehold house, No. 7, Kimpton-road, Camberwell-green, term 99 years from 1855, ground-rent 3*l.* 12s. per annum, let at 19*l.* 10s. per annum—125*l.* By Messrs. Toplis & Harding.—Freehold house, No. 1, Cook's-court, Carey-street, Lincoln's-inn-fields—900*l.* By Messrs. Prickett & Son.—Leasehold house and shop, No. 20, Lisle-street, Leicester-square, term 98 years from 1792, ground-rent 20*l.* per annum, let at 66*l.* 10s. per annum—520*l.* Leasehold house, No. 26, Lisle-street, term 98 years from 1792, ground-rent 15*l.* per annum. let at 40*l.* per annum—350*l.* Leasehold house and shop, No. 88, East-street, Manchester-square, term 96 years from 1790, ground-rent 6*l.* 6s. per annum, let at 52*l.* 10s. per annum—395*l.* Leasehold house and shop, No. 90, East-street, held under lease for the same term and at the same grouud-rent as last lot, let at 50*l.* per annum—400*l.*

Loughborough Dispensary.—This structure, the gift of Miss Herrick, is now completed. The front is of white brick, with Derbyshire stone dressings, and is surmounted with a massive cornice in stone. The most striking feature is a very large oriel window from the visiting-room on the chamber floor, looking out of the west front, executed also in stone. There are two entrances,—one on the west front for out-patients, and the principal entrance on the north front, facing the street: it is approached by a flight of steps, of large surface. The dressings to the doorway are in Derbyshire stone, with red Mansfield columns, contrasting in colour, on each side. The ground floor contains entrance-hall, running through the building from north to south fronts, and also from west to east, and crossing at right angles about midway. There are two large rooms, each about 30 feet by 14 feet, intended for men's sick wards. The ground floor also contains surgery, consulting-rooms, patients' waiting-room, matron's rooms, kitchen, scullery, and other necessary apartments. The chamber story is approached by a stone staircase leading from the entrance-hall, and has also two apartments, precisely the same, and situate over those on the ground floor, and set apart for women's sick wards. The remaining part of the chamber floor contains night-room, surgeon's, matron's, and servants' bed-rooms, also an operating-room, lighted from the roof, and fitted up with every necessary convenience. The works have been carried out by Messrs. Osborne, Brothers, of Leicester, under the direction of Mr. William Slater, of London.

Tulse Hill.—On the 16th instant, the new National and Infant Schools for the district parish of Holy Trinity, Tulse Hill, Surrey, were inaugurated. They are built of yellow and red brick, with Bath stone facings and traceried wood window frames, and have a tower with open-timbered bell-turret and spire. The three rooms are made to communicate by means of sliding partitions. They have been erected at the cost of about 2,000*l.*, including the site, by Mr. Pearce, of Brixton Hill. The architects are Messrs. Henry & J. Douglass Mathews, whose design, we understand, was selected in a limited competition.

A Winter Garden for Paris.—A company is now being formed in Paris, according to the *Journal du Havre*, for the purpose of transforming the garden of the Palais Royal into a winter garden, like the immense greenhouses annexed to the palaces of the wealthier Russian nobles. The company proposes to bear the whole expense of making the garden a place of recreation unequalled in the world. It would be devoted to concerts, games of all kinds, artistic exhibitions, &c. In May, every year, the glass roof would be removed, and the garden opened to the public as usual.

Statues.—Mr. Woolner is commissioned to execute the statues which are to decorate the new Manchester Assize Courts, now in course of erection from the designs of Mr. Waterhouse.——The marble statue of Eurydice, by Mr. Nanteuil, which, for the last twenty-five years has stood in the garden of the Palais Royal, Paris, has just been removed and replaced by a copy in bronze. The original has been placed in one of the museums, in order to protect it from the inclemency of the weather.——Workmen are now engaged in placing in the Gothic arcades of the grand front of Notre Dame the eight remaining statues to complete the twenty-eight which stood there previously to 1793, and which represent as many kings of France from Clovis up to Philip Augustus.

Wall Papers in Relief.—The relief wall-papers made by Messrs. Scott, Cuthbertson, & Co., of Chelsea, deserve the attention of those who are decorating. The mode in which relief is attained by this firm is by the repeated printing of flock upon flock either upon a gold or a plain ground: in the latter case the paper is hung with butt (not overlapping) edges; and, after being well sized, is reduced to one tint by an even coat of oil paint. In both cases the effect is very good. A simple lozenge pattern, about 3 inches in height, being in uncoloured flock on a gold ground, in relief, to the height of about a quarter of an inch, is exceedingly pleasing. They exhibited at South Kensington some panels which, while differently treated, were yet all raised: these are repeatedly printed in flock; then painted; and finally subjected to a second printing for the sake of adding gold and other colours.

Want of Work a Crime.—It appears that many of the Lancashire operatives out of work have gone on the tramp in search of employment, and that the Dewsbury guardians are put to unusual expense in consequence. An ingenious guardian of the poor, called Goldthorpe, has invented a delicate test whereby he hopes to detect impostors who pretend to be in want of food and lodging. Each person, man, woman, or child, who has the daring presumption to ask admittance to the Dewsbury workhouse, is passed through the hands of an underling, who is said to be almost an idiot, and who forces them over head and ears into a pool of cold water, clothes and all; and women and children as well as men; if they refuse to strip voluntarily and be doused: otherwise, with extreme and surprising propriety, the women are handed over to a female douser. Mr. Goldthorpe very ingenuously admits that such a mode of passing through the water to the paradise of Dewsbury workhouse "is no use unless as a punishment" to the impostors! And that as for the cold of winter, he "would be for adding ice, and making it a little colder." One could almost wish that the Goldthorpe "punishment" would kill some poor starving wretch outright in order that the law might lay its claws on the revolting blockheads who practise so absurd a method of discrimination between impostors, who will stand the test, and innocent people, who must vicariously suffer the ridiculous "punishment" merely for being in a state of starvation, or for being liable to be mistaken for impostors. These idiotic guardians of the poor ought at least to pass under the hands of their own idiotic douser.

Tenders for British Iron for Government. The tenders for the supply of British iron to her Majesty's dock-yards were opened last week in the presence of the Lords of the Admiralty. There was considerable competition in the iron trade for this contract. The successful competitors were the firm of Moser & Sons, of Southwark and Upper Thames-street.

St. Thomas's Hospital.—The governors of this institution are now understood to be negotiating with the Fishmongers' Company for the purchase of a plot of ground in the Walworth-road, a little beyond the Elephant and Castle, as a site for the new hospital. The piece of ground is between seven and eight acres in extent. The Fishmongers' Company are understood to have offered the site to the hospital authorities for 40,000*l.*, *plus* certain expenses, which are not to exceed 5,000*l.* The negotiation cannot be concluded without the approval of the governors of the hospital.

Bigotry in Taste.—Art and science have also their intolerance. Hear the orthodox physician talk of his innovating brother. No coarser libels have been written than those in scientific journals against a professor of science. In art an artist forms his theories and his school, and has an enthusiastic faith in their indubitable superiority: the artist of a different school he regards as a Goth. One of the mildest poets I ever knew, who had nurtured his own harmless muse in the meek Helicon of Wordsworth, never could hear Lord Byron praised, nor even quoted, without transports of anger. I once nearly lost one of the dearest friends I possess, by indiscreetly observing that the delineation of passion was essential to the highest order of poets, simply because he had formed a notion, in the rectitude of which he had the strongest good faith, that perfect poetry should be perfectly passionless. I am not sure, indeed, whether there be not, nowadays, a more vehement bigotry in matters of taste than in those of opinion. For so much has been said and written about toleration as regards opinion, that in that respect the fear of not seeming enlightened preserves many from being uncharitable. But, on the contrary, so much is every day said and written which favours intolerance in matters of taste, that it seems enlightened to libel the whole mental and moral composition of the man whose taste is opposed to your own. I have known language applied to a difference of taste on the merits of a poet, a novelist, nay, even an actor, which the Bishop of Exeter would not venture to apply to Tom Paine.—*Sir E. B. Lytton, in Blackwood's Magazine.*

The Engine Driver to his Engine.—We find the following lines in *Blackwood* for the current month, under the signature of "W. J. M. R.:"

Put forth your force, my iron horse, with limbs that never tire!
The best of oil shall feed your joints, and the best of coal your fire:
So off we tear from Euston-square, to beat the swift south wind,
As we rattle along the North-West rail, with the special train behind:—

Dash along, crash along, sixty miles an hour!
Right through old England flee;
For I am bound to see my love,
Far away in the North Countrie.

Like a train of ghosts, the telegraph posts go wildly trooping by,
While one by one the milestones run, and off behind us fly:
Like foaming wine it fires my blood to see your lightning speed:
Arabia's race, ne'er matched your pace, my gallant steam-borne steed.

Wheel along, squeal along, sixty miles an hour!
Right through old England flee!
For I am bound to see my love,
Far away in the North Countrie.

My blessing on old George Stephenson! let his fame for ever last;
For he was the man that found the plan to make you run so fast:
His arm was strong, his head was long, he knew not guile nor fear:
When I think of him it makes me proud that *I'm* an engineer!

Tear along, flare along, sixty miles an hour!
Right through old England flee!
For I am bound to see my love,
Far away in the North Countrie.

Now Thames and Trent are far behind, and evening's shades are come:
Before my eyes the brown hills rise that guard my true love's home:
Even now she stands, my own dear lass! beside the cottage door,
And she listens for the whistle shrill, and the blast pipe's rattling roar:—

Roll along, bowl along, sixty miles an hour!
Right through old England flee!
For I am bound to see my love,
At home in the North Countrie.

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